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Galaxy

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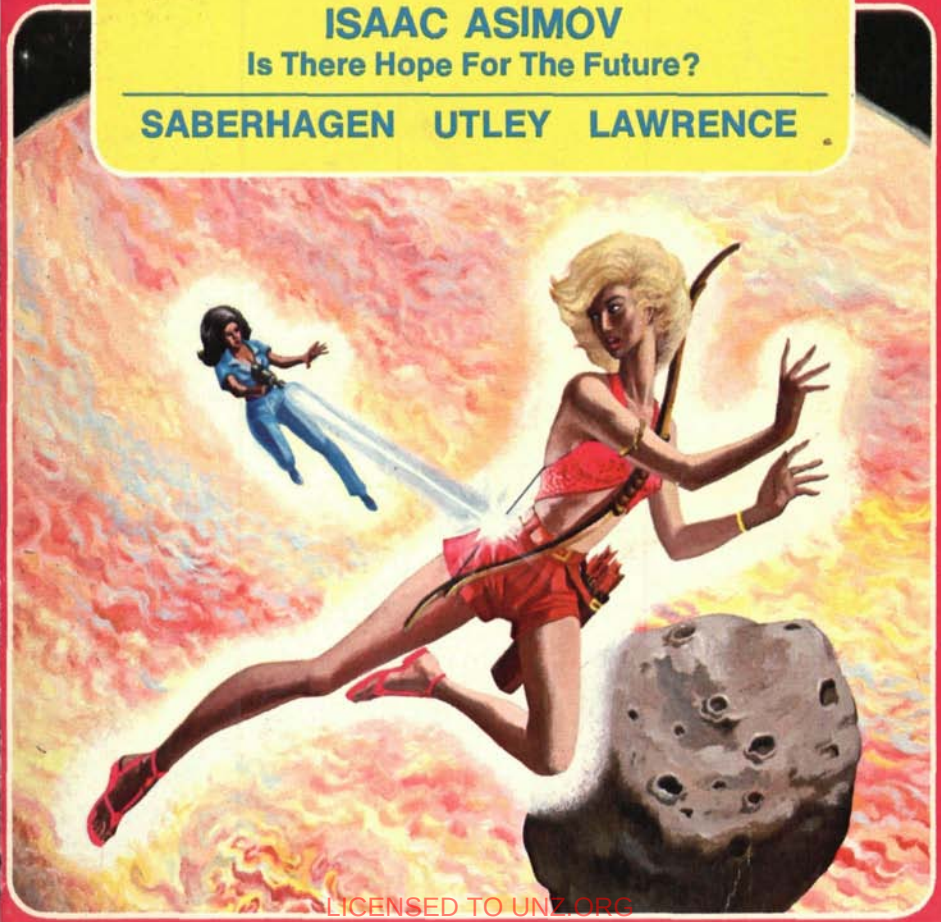

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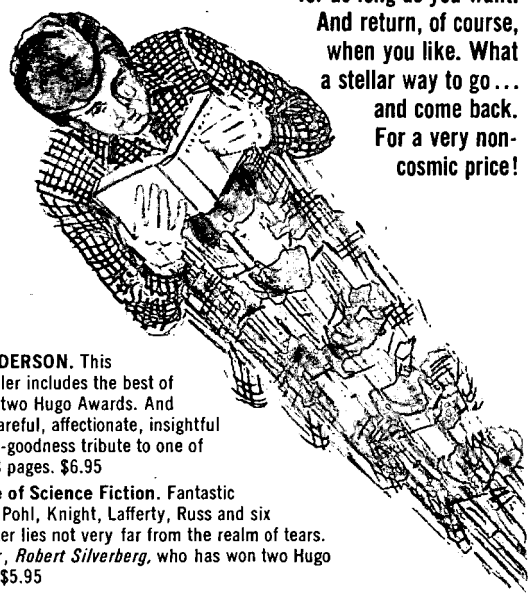

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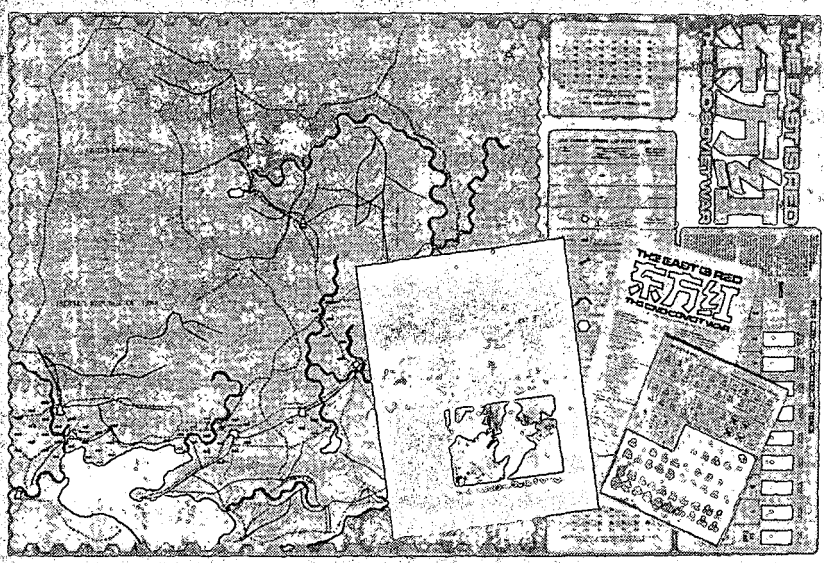

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JULY 1974
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Galaxy
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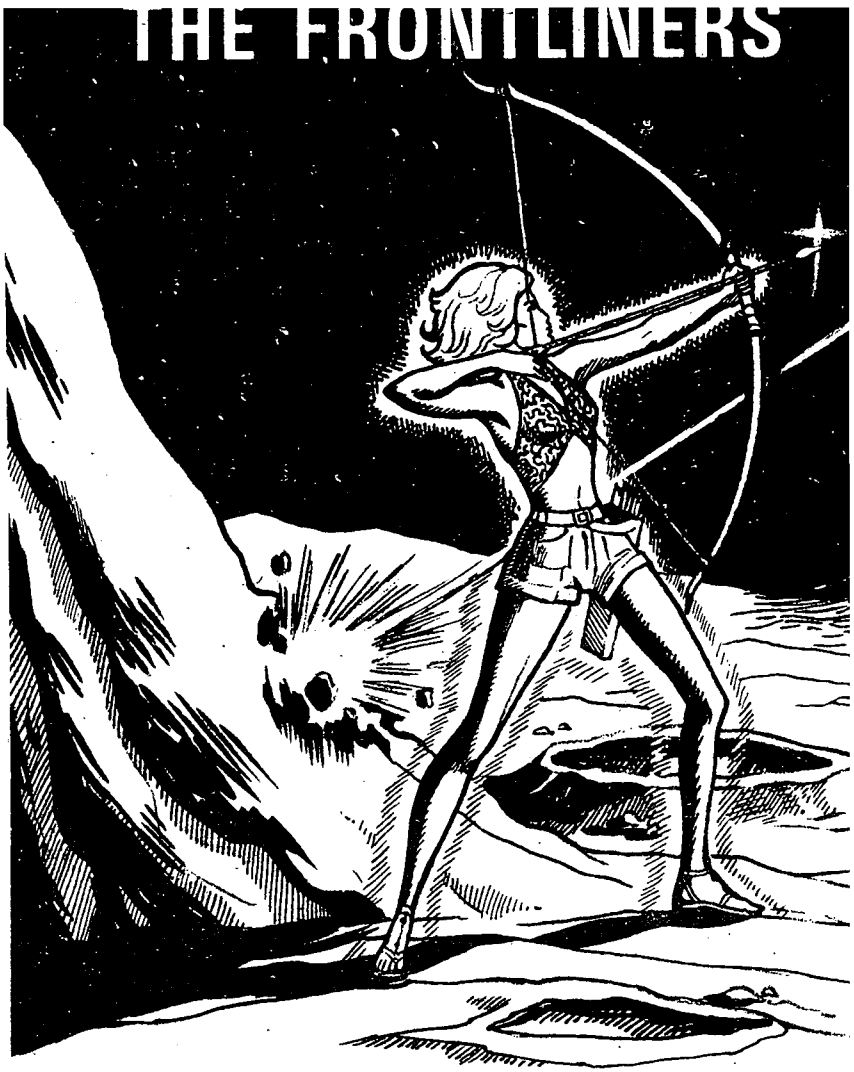

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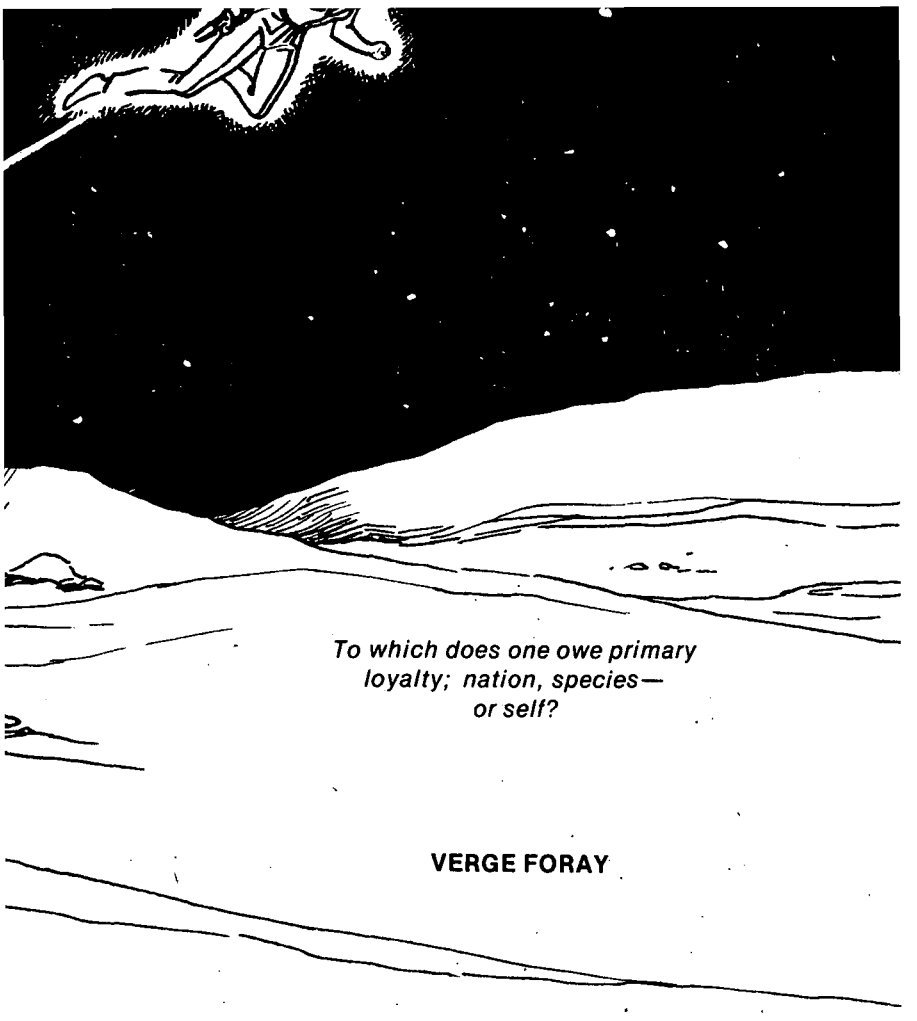

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I

"RAYEAL PROMTON, I presume."

The voice was an assured feminine purr behind Gweanvin Oster. She twisted her head to look up at the smiling woman, then rose from her chair at the work console.

"Yes, I'm Rayeal Promton," Gweanvin said, "and you must be Marvis Jans, girl security man."

The woman nodded. "How did you identify me so quickly?" she asked.

"Because I was expecting you. What's being done here on Narva, and more specifically here in Gordeen Consolidated Systems Lab, calls for the presence of the Federation's sharpest security agent. That's you. And you wouldn't come here and not take a look at your genetic sister. Of course, now that I've had a close look at you, I see that your nose is like mine . . . based on permanent bone instead of cartilage."

"And just what is being done in this building, Rayeal?" Marvis Jans asked softly.

Gweanvin laughed. "Is this a friendly visit or a security interview? Okay, so I've guessed a lot more about this project than my job requires me to know. Does that surprise you?"

"No." Marvis smiled. "A mind like yours is wasted on circuit growth technology, Rayeal. You should be a frontliner like myself. It's far more challenging work."

"I don't know," murmured Gweanvin. "I've thought about it, but sabotage, spying, counter-spying and other such derring-do strikes me as awfully masculine."

"Humpf! I like that!"

Gweanvin giggled. "No asperations on your femininity intended, Miss Jans. Maybe I'd be more willing to swash about with a zerburst pistol on my hip if my hips were as curvy as yours." She paused, giving the older woman's figure an admiring once-over. "Gosh, how gorgeous you are! I hope I'm that well-stacked when I grow up."

"Thank you, dear." Marvis let her pleasure show. "You are twenty-seven standard years old, aren't you?"

"Yes. And you're about thirty-four."

"Right. If you develop at the same rate I did you'll start budding very soon, Rayeal."

"I've already started," Gweanvin grinned, "and not a minute too soon to suit me. I'm tired of looking like a boy."

"I wish you *were* a boy," Marvis remarked wryly.

"I'll bet you do," snickered Gweanvin. Then she asked more seriously, "Any clue of where one might be?"

"A male of our species? No, not a clue."

Gweanvin considered the undertones of that brusque reply. "That

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bugs you, doesn't it?" she asked.

"When your urges become as strong as mine . . ." She shrugged and turned away. "Isn't there any coffee in this joint?"

"Sure. Over here."

Gweanvin led the way to the spenser and drew steaming mugs for Marvis and herself. She motioned her visitor into a chair and seated herself nearby.

"Why not talk about it?" she asked. "Your search for a male is no secret from me."

"Aha! Spying on a Federation security agent, hah?"

"Oh, don't be such a warrior!" snorted Gweanvin. "Of course I've been spying on you, and you've probably known it all the time! Or certain friends of mine have, but don't fret. They're security people, too, and haven't told me any deep Federation secrets. They've merely kept me informed on your male-hunt."

Marvis sipped her coffee. "I was kidding you, dear. Of course I know what you've been up to. I haven't tried to keep my hunt all that secret anyway—because there may be a male somewhere as eager to find me as I am to find him. I wanted a bit of publicity."

"But nobody turned up?"

"Oh, a lot of guys turned up, but not one of us. Some looked like good bets but cases of delayed maturity are not unheard of among ordinary homo sapiens; that's all any of them turned out to be." She studied Gweanvin's face questioningly. "Just how much did your friends tell you about my search?"

"Well, they told how you finagled a permit to go into the Federation's central personnel files and run a computer check for individuals with genetic charts that match your own. My name was the only one thrown out—and you already knew about me, didn't you?"

Marvis nodded. "Go on."

"All right. Next you enlisted Monte's help. It assisted by working out a scheme to get one of our agents into the Commonality's personnel files to see what they had to offer."

"Monte's a *he*, not an *it*," put in Marvis. "The feel is definitely that of a masculine mind, as anyone who has ever been on Orrbaune knows."

"Which I haven't," said Gweanvin, "but we'll soon know the feel of Monte's mind here on Narva, won't we? If the project's a success, that is. Right?"

Marvis gave her a cool smile. "If you expect a security agent to join you in loose talk about a secret project, dearie, think again. Get back to the subject."

"Well, that's about all I know, except that you had no luck with the Commonality files. All that search produced was another female . . . somebody about my age named Gweanvin Oster."

Marvis nodded slowly. When she said nothing, Gweanvin added,

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"I'd like to know more about that Oster wench."

Marvis smirked. "Don't ask me, Rayeal, dear. Check with those spies of yours. If they can't tell you anything, tough."

"Not that tough," Gweanvin replied equably. "If you find out Miss Oster has located a male—and that's the only thing about her I'm really interested in—I'll know soon enough. When you vanish into the Commonality."

Marvis gave a little chuckle. "You think I'd be so unpatriotic as to defect for a man?"

"Yep. And so would I."

"Well . . . you could be right about that," murmured Marvis. "Actually, Rayeal, I don't mind telling you about Gweanvin Oster, but there's precious little to tell. She's a Commonality frontliner. We're unable to obtain data about her appearance, present activities, or whereabouts."

"Then . . . she may have found a male!" breathed Gweanvin, all wide-eyed ingenuousness.

"Unlikely. Our information is fairly solid on one point—that she's on assignment, not off in the bushes."

"Oh."

For a while Marvis gazed at Gweanvin without speaking.

"You needn't peer at me like that," Gweanvin protested. "I'm not Gweanvin Oster, and I've got a long pedigree to prove it."

"I almost wish you were," grumbled Marvis.

"Why? Would you and the whole security bureaucracy enjoy looking like champion idiots?"

"I'm referring to the odds," Marvis said.

"Which odds?"

"Those against three mutant females being born without a single matching male." She frowned. "Don't tell me that hasn't occurred to you, too."

Actually, it had not, because Gweanvin knew there were only two females, not three. She realized she had made a slip with that "Which odds?" question . . . a rather subtle slip, but one that could nevertheless blow her cover sky-high . . . and just when her assignment was reaching the pay-off point. Had she shown dismay? No. Like Marvis, she had the ability to maintain a perfect poker-face at will.

"Surely you understand the laws of probability better than that!" she exclaimed. "Or does security work dull the reasoning powers?"

Marvis replied flatly: "I know the odds are eight to one against flipping a coin for three heads in a row. If there were no factors working against the conception of a male . . . if the odds were fifty-fifty in any given birth, then at least one of us three should be male."

Gweanvin laughed. "Have you actually done any coin-flipping recently?" she asked.

"Of course not! Why should I?"

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"Try it sometime. It should make you happier about those 'odds'. I tried it myself not long ago, and flipped a sequence of five tails, one head, another tail, three heads, two tails, two heads, a tail, and so on. What were the odds against my starting out with a sequence of five tails like that?"

"Well . . . thirty-two to one. But a run like that is unusual."

"Sure, but it happens! I made over a hundred tosses without getting another string of five. But I had three fours, and five runs of three.

"The point is, Marvis, that probability works out to what we call 'the law of averages' only when we're dealing with a statistically significant number of events . . . the more the better. A gambler can actually have a lucky streak, you know. But he doesn't leave the game a winner unless he gets out at the right time. If he keeps playing long enough, the law of averages catches up with him. Don't depend on what you've read about probability, Marvis," she concluded with a grin. "Get a coin and start flipping it. The results should prove therapeutic."

Marvis thought about it for a moment. "You're right about mathematical probability, Rayeal," she said at last, "but the circumstances leaves the possibility open that something is repressing conceptions of males of our species."

Gweanvin shrugged. "A possibility, sure. In which event, we'r not the next evolutionary step fo man, just three more old maids i the making. And if so, so what? see no signs that man's about t cave in for lack of a new breed anyway. But I don't really thin that, Marvis. I think we're bein balked out of motherhood, tempo rarily, by a streak of bad luck."

"I hope you're right. I . . . Marvis paused in the listening att tude that told Gweanvin someon was speaking to her via her com munications-implant. "Right away Thydan," she responded to th call, then looked up at Gweanvir "I must run along, dear. Som people I'm supposed to join fo lunch."

"Oh. I'm sorry. We've got s much to talk about," said Gwear vin, rising.

"I'll have some time later, Marvis assured her, walking towar the door. "I'll get in touch."

Gweanvin followed her. "On thing I simply must ask you now You've been mature, sexually, fo some years, Marvis. Are you *sur* we can't procreate with an ordinar homo sap male?"

Marvis paused on the balcon jutting into the building's westwin scramble area and turned. "I'r positive, dear. And that's not the oretical." She gave a slight smile "Maybe I did not bother with coin flipping, but *that* I checked ou with experiment. Many experi ments, in fact. We're a new an

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lifferent species, Rayeal. We can't ross-breed with the old."

"I was afraid of that," nodded Gweanvin, soberly.

"Sorry. See you later, dear."

Marvis stepped off the platform and pummeted downward on semi-inert transport mode. Probably on her way to the tightly restricted basement test-chambers, Gweanvin guessed. She knew the project was due to reach its climax very soon, probably that very afternoon. The arrival of Marvis Jans made that almost certain . . .

Across the scramble area from her balcony was the balcony and open door to Don Plackmon's office, with his desk so situated that he could sit looking out. When she glanced that way she found Don watching her. She waved, and he waved back: Don was supposed to be a circuitry growth technician . . . and he wasn't too bad at it . . . but she suspected he also had a security function. On a project like this one of every two people were probably involved in counter-espionage.

And how many were spy-saboteurs?

None but her, she guessed. An operation such as this was too thoroughly guarded. First, it took the ability to lie to an emo-monitor without detection, which was something not one human in a thousand could do. Also it took a personal history that could be checked out by some of the most suspicious eyes in the Federation without revealing a flaw. That kind of cover took time, effort and money to build. Actually, it took a long-established family, one which had devoted itself for generations to the job of resembling loyal citizens of the Lontastan Federation, for Gweanvin Oster to be "born into"—with a minimal and painstaking doctoring of public records—as Rayeal Promton.

And getting inside this kind of project required one more thing: a reason for being there. To work on something that would of necessity involve circuitry growth one became an expert circuit-grower. The more expert the better. And with her mental equipment, Gweanvin had not had too much trouble becoming tops in the field, so far as the Federation was concerned. The Primgranese Commonality had the real leadership there, and Gweanvin had the benefit of being coached for her assignment by some of those leaders.

She knew more of circuitry growth than she was using on this project—and she was using more than her Lontastan colleagues knew.

Thus, she might actually wind up a net contributor to the Lontastan project if she were caught, or her assignment goofed in any way.

She returned to her work console. It lighted as she sat down, revealing the bitbox diagram she

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had been studying when Marvis Jans interrupted her. In a sense, this was makework she was doing—the examination of alternate possibilities for the Lontastan version of a Bauble. Just in case the Bauble her section had completed, and that was now resting well-guarded in one of the basement test chambers, failed to work.

She knew it would work . . . and do other things the Lontastans would find far less desirable. This territory had been explored by Commonality scientists over a decade earlier, after the success of the first Bauble telepathic-communication systems led to a great deal of experimentation into the potentials of various Bauble-type constructs.

Was anything happening in the test chamber yet?

While continuing to gaze studiously at the console screen, she exteriorized from her body and—as an ego-field—dropped to the basement room. There she touched the Bauble gently, not really entering it, but establishing enough contact with it to use some of the special features its circuitry contained, features the Lontastans knew nothing about.

She found the Bauble was unchanged. It was in contact only with the pedestal on which it sat, like a beachball-size pearl. Nor was any field, ego or electronic, impinging on it. Judging from the silence of the room, no human was in the test chamber where it waited.

So Marvis Jans and the others who were to be on hand for the test probably actually were at lunch. Nothing would happen for at least an hour. And speaking of lunch . . . she had better start the afternoon with a full stomach herself. Her cover might be blown if her plans slipped just a little, in which event days might pass before her next solid meal.

II

She walked out on her balcony, semi-inerted and soared across the scrambleway to Don Plackmon's office. He watched her approach, and stood up and stepped around his desk when she came in. He gave her a squeeze and a kiss to which she responded with casual pleasure. Don was nice—and handsome as well.

She pushed herself back from him after a moment and said, "I know I'm early for your invitation to lunch, Don, but I'm starving. Let's go now."

"Sure, Rayeal," he agreed, nuzzling her. "You always give me an appetite."

"For what?"

He chuckled. "I'll settle for food right now. Look. Old Marchell wants to join us, and much as I'd prefer to be alone with you, it's not good form to say no to the boss. I'd better give him a call."

"Okay," she nodded.

Plackmon tongued his toothmike

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and commed briefly with Boll Marchell while Gweanvin considered the point that Marchell was not with the lunching group of bigwigs, which probably meant he would not be present at the upcoming test. Security wraps must be on very tight indeed to exclude one (and perhaps both) of the two major production chiefs, she mused.

Plackmon reported, "Boll says for us to go on and he'll join us in a few minutes."

"Good. Let's go."

They left the office and soared up through the scramble area to the dining garden level, which they entered and found a table for three where Marchell would see them when he arrived. "I'm going to try something on the ancient Egyptian menu today," said Plackmon.

"Go ahead. I'm in a steak and potatoes mood myself."

He laughed. "You weren't kidding about being starved."

They punched their orders, and Plackmon said, "Was that dish who came to see you who I think it was?"

"How you ever get any work done with all your girl-watching, I'll never know," Gweanvin replied tartly. "Yep, that was my fellow mutant, Marvis Jans."

"You're much prettier than she is," he murmured, leaning close. "She doesn't have your full lips."

"Yeah, but she's got a lot of full other places I don't—as you might just possibly have noticed."

Plackmon laughed. "Give yourself time, Rayeal. You're beginning to bud very nicely." Their lunches arrived and they busied themselves with eating for a moment before he said, "I find it very hard to think of you as a mutant, you know. You don't look all that unusual. Neither does she. It's hard to imagine your genes being so different from mine."

"Genetic tension," she replied around a mouthful of extremely rare steak.

"Tension?"

She nodded. "That's part of evolutionary theory which post-dates Darwin by several centuries, after geneticists began to find out how such things really work. You're the same species as *Homo Neanderthalensis*, who was chipping flint on Earth thirty thousand years ago. He was homo sapiens the same as you, but if you saw him you probably wouldn't be sure he was even human—and he would be just as dubious about you. But still you could mate and produce off-spring. And knowing you, you probably would."

"Only in a pinch, my dear," he chuckled.

"The difference between you and Neanderthal Man can be summed up as genetic tension," she continued her explanation. "The species changes, adapts to new environmental demands and to somatic responses to our conscious ideas of what man should be.

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Changes in the genetic structure go with these adaptations, but they aren't the kind of basic changes that mark a difference of species... only the difference between individuals or races *within* a species.

"But they do place something of a strain on the original pattern. This strain, genetic tension, gradually builds toward a point where no further departure from the original is possible without breaking the species pattern itself. Humanity reached that stage in late Earth-Only times, it seems. People have been pretty much the same ever since.

"But in the meanwhile, we've changed our environment drastically. We have our life-support implants that enable us to live on almost any half-way habitable planet—or go streaking through interstellar space stark naked, for that matter. We've found the psych-release techniques with which to clean up ourselves, as ego-fields, and eliminate insanity. We've developed the econo-war as our major social institution, simply to make existence more of a competitive challenge than it would be otherwise. All of which adds up the fact that homo sapiens needs to change into something as different from present man as present man is from the Cro-Magnon. But he can't, because his genetic tension is already as tight as it can get.

"So," she finished, "here we are, Marvis Jans and myself—and Gweanvin Oster in the Commonality. We have some structural differences that set us apart from homo sapiens, such as nasal bridges of solid bone. Also we mature more slowly and probably live longer. But the really important difference is that genetically we're a new species, with zero genetic tension. Our offspring can adapt like mad for a long time to come. *They're* the ones who'll really be different."

Plackmon nodded slowly, and started to speak but at that moment Boll Marchell joined them. "Hope I'm interrupting something intimate," he remarked, favoring Gweanvin with his best dirty-old-man leer.

"Rayeal was just explaining why my love for her is tragic," Plackmon replied. "Sit down, Boll."

Marchell sat, punched his selection on the menu. "Gene-crossed lovers, hah?"

Gweanvin said, "I think Don's real throb is for a big-busted visitor I had this morning. His eyes bulged out into the scrambleway when he saw her."

"Marvis Jans?" asked Marchell.

"Yes. Have you met her?"

"Just briefly."

"What do you think of her?"

"Well, if you and she are does I'd hate to tangle with the buck!" Marchell chuckled. "She's quite a doll, but hardnosed in more ways than one."

"One step farther from the primordial flat-faced apeman," said

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Gweanvin. "Do you really find her formidable?"

"Damned right I do. And you, too. That's why I'd hate to tangle with a male of your species."

GWEANVIN thought about it, puzzled momentarily. "Oh, you mean because men are more competitive, more combative than women," she hazarded.

He nodded. "Yours would make a terrific econo-warrior—if he bothered with the econo-war at all."

Gweanvin considered the point with interest. She hadn't thought of the missing male from that standpoint before. What Marchell had said about the male role was certainly true for humanity and numerous other species.

"What else is the male's job?" she asked.

"Finding and courting a mate, of course," said Marchell.

"Well, ours is certainly goofing on that," she replied.

"Or biding his time perhaps. I get the impression Marvis Jans is trying to do both his job and her own as well. The typical female role is merely to make known her presence and readiness, by whatever means of communication is appropriate for the species. Miss Jans has done that. Now she's searching, and that's usually the male's prerogative."

Gweanvin chuckled. "Then it's enough for Marvis or me to announce, 'Here I am. Come get me.' And then wait for Mr. Super-Econo Warrior to show up."

"Probably. And just keep yourselves amused in the meantime, you with the project and such as poor Don here, Marvis with her frontlining and every homo sap who lays eyes on her."

"Speaking of which, I have a hunch big things are about to happen on the project, now that Marvis has come to make sure our labs aren't spy-infested. Pay-off time may be here, gents."

Plackmon grinned. "You still think our project is Monte-related?"

"What else?" she shrugged. "We are on Narva, a nothing-planet except for being Orrbaune's nearest habitable neighbor—a mere six light-years away from where Monte is, of necessity, permanently located. And our section has been building a . . ."

"If you're going to give us one of your speculative commentaries on the nature of the project," Plackmon broke in, mashing a button on the table's control box, "let's keep it between the three of us." A baffle-screen snapped on surrounding the table, effectively curtaining the occupants and their words from others in the dining garden.

Marchell laughed. "We don't need security agents with Don around," he said.

"Yeah, I wonder sometimes if his interest in me is as ulterior as he

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pretends that it is," said Gweanvin.

"I'm merely a conscientious little econo-warrior," Plackmon contended stoutly. "As you were about to say . . ."

"Well, our section has been building what we hope is a reasonable facsimile of the Primgranese Commonality's telepathic transceiver, the Bauble. We don't know—or I don't—what the other section's been doing. But my guess is that they're working on a communications link to tie Monte on Orrbaune in with the Bauble here on Narva.

"Now, essentially, a Bauble is just a dead device," Gweanvin continued, with the eagerness of a bright child showing off its talent, "whereas Monte is a living being, not only capable of receiving and sending telepathic messages, but of originating thoughts of his own. This makes him far superior, and more useful, than a Bauble could ever be. But one shortcoming of both Monte and a Bauble is limited range. One can cover a single planetary system, and that's all.

"What we really need to get ahead of the Primgranese is a Federation-wide telepathic comm system, something that can spread throughout our portion of the galaxy. Maybe it would be possible to link Baubles alone into that kind of network, but the Primgranese must be trying that, with no success that I know of.

"Anyway, we have Monte, and would want him in our network. And if we have some linkage system to tie him in with a Bauble at interstellar distance, the logical place to locate the first test Bauble would be right here on Narva. Otherwise, this underpopulated ball of dirt would be about the *last* place in the Federation to rate a Bauble."

She paused, looking at Boll Marchell, then asked, "Well, what do you think?"

Marchell grinned. 'I think it would take one hell of a comm system to link Monte with the Bauble when they are six light-years apart."

"Yes," she nodded, "that's what fascinates me. All our section has done is try to duplicate Primgranese work. But Hobard Dawnor's section . . . gosh, I'd give my eye teeth to know what they've got!"

"You never had any eye teeth," said Plackmon.

"Figure of speech," she replied absently. "Of course the actual spanning-signal could be an exceedingly broad-band version of standard subwarp communications. What intrigues me is the nature of the interface between Monte and the transmitter on Orrbaune, and between the receiver and the Bauble here on Narva. In other words, how is telepathy translated into transmittable signals, and how are those signals then converted back into telepathy? That's the real breakthrough involved in this project."

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"And you can't figure it out?" asked Marchell.

"No. In fact, I bet Monte himself had to figure it out. Who else would know enough about telepathy?" She studied him closely. "You know if I'm right or not, Boll," she accused, although she knew he did not, "but you won't tell me."

He chuckled. "That's econo-war for you, Rayeal. Never let your right hand know what your left is doing."

"Suppose you are right, Rayeal," said Plackmon, wearing a serious frown, "don't you think such a project has some disturbing implications?"

"I don't see why it should," she lied. "I would think it might bother my new friend Marvis Jans, though. If Monte's telepathic ability is extended over the whole Federation, that'll put all our internal security agents out of work, her included."

"That's what I'm getting at," said Plackmon. "Every Federation citizen's mind will be subject to scrutiny. As matters now stand, those of us who prefer to keep some mental privacy have the option of staying away from Orrbaune. If your speculating is accurate, we're going to lose that option."

"That doesn't sound much like the conscientious little econo-warrior," Gweanvin kidded. "Actually, though, I'm a little hesitant about giving up mental privacy, too. But if everybody else does . . . and the people on Orrbaune don't seem bothered by it. They say Monte is a perfect gentleman and very discreet. He doesn't spread around the thoughts that need to remain private. And since he's not human, it doesn't matter much if he knows a person's thoughts. He doesn't take advantage. And if you're worried about some kind of thought control, he steers totally clear of that."

"Now, but will he always?" Plackmon argued.

Gweanvin shrugged. "What's 'always'?"

Marchell put in, "The Primgranese gave up emotional privacy long ago. They use emo-monitor implants, and it doesn't seem to bother them. It merely improves communication."

"We would have had emo-monitor implants of our own by now," said Gweanvin, "except that if this project is a success we won't need them—so they're dragging their feet on getting them into production."

"You sound so sure of everything you say," laughed Plackmon. "Is that because you're a woman, or is it a characteristic of the new breed?"

"It's because we're having an argument," she replied. "If I'm right about the purpose of the project I don't want my triumph weakened by a lot of 'perhapses' and 'maybes'. And if I'm wrong you guys won't be polite enough to remember any 'maybes' anyway."

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III

THE lunchtime conversation was a mild disappointment to Gweanvin. She had hoped to learn something from Marchell about plans for the test, but obviously he knew no more and had guessed far less than she had.

After the normal amount of clawdling about after lunch, she returned to her work console and pretended to be absorbed by her task while she exteriorized once more and returned to the test chambers and the Bauble.

She found it still untouched but now there were sounds in the test chamber. Equipment was being brought in, she judged.

"This has to be turned slightly to the left," she heard someone say.

"That enough?" said another voice.

"Yes. Good. Now roll it closer. It has to be in contact with the Bauble."

"Okay . . . how's that?"

Gweanvin felt the contact. Something was touching the Bauble over about thirty per cent of one side of its surface. Aha! This was it! The interface system that she had to probe. She shifted all her attention to that part of the Bauble surface, but found nothing but touch-pressure. The interface was inactive.

"Hadn't we better switch it on and check for good contact?"

"No. We turn nothing on until the test begins. Don't worry about

Ballantine Books

We could rave on for paragraphs about James White's new novel for us: THE DREAM MILLENNIUM [$1.25]. But since Galaxy had the great good sense to serialize this book earlier in the year, we need wax enthusiastic for only a few lines. For those of you who may have missed the serial, TDM is a cracking good sf yarn about an enormous starship set to travel through space for 1,000 years in search of a habitable planet for Man to settle. The passengers aboard this colony ship are all plagued by strange and dreadful nightmares. Unless the ship's commander, John Devlin, can find a way to control this disastrous dreaming, his charges may all be driven mad. All in all, a superb hard-core novel in the grand tradition!

• • •

One of the things we like to do each year is gather Larry Niven's most recent short stories and articles from a variety of magazines and publish an impressive collection for Larry's fans around the world. This year's addition to the Niven Library of Impressive Science Fiction is A HOLE IN SPACE [$1.25]: stories about teleportation, deep space, black holes, artificial worlds and Louis Wu—our old friend from the "known space" cycle. Once again Larry Niven proves he's a masterbuilder of fantastic worlds. For example, imagine a world in which the invention of displacement booths [step inside and teleport anywhere!] has produced one hell of a crime wave. If a man in, say, Hawaii can commit murder in, say, Chicago and be back in the time it would take him to make a phone call, he would have a seemingly perfect alibi. And the police would have a problem, as they do in "The Alibi Ma-

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chine." In addition to lots of fiction, Larry has provided a particularly interesting article for this collection. "Bigger Than Worlds" is a marvelously detailed study of enormous artificial worlds, including the famed Dyson Sphere and Niven's own adaptation—his inimitable Ringworld. Must reading!

• • •

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the contact. It's good, all right."

Footsteps moved away from the Bauble and the test chamber was silent once more.

Gweanvin used the delay for one last review of her contingency plans.

The Gordeen Consolidated building was not designed for the convenience of spy-saboteurs. Its outside walls were thick, tough, windowless. To leave in the normal manner meant going out on her balcony, semi-inerting, flying up through the scramble area to the roof exit seventy-one floors above, where one of the gates would check her identity and let her through.

Minimum exit time: ten seconds . . . *if* she ran into no traffic jams, and *if* the gates had not been alerted to detain her.

Still, that would be the best way out if she had time to use it. If not . . .

She opened a drawer of the console desk, considered its clutter of contents, took a light-pen out of it. She used the pen to streak a pair of trial vectors across the diagram on the console screen, and gazed studiously at the result.

The drawer's contents were such as most anyone might accumulate over a period of a few years on a job. Some items, such as the light-pen, definitely belonged there. Others, such as a zercrown and a couple of sheets of slightly worn warprag, did not belong but were readily explainable, in case anyone asked. The warprags, for example,

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she had swiped from one of the shops—which no one would mind—with the intention of taking them home to see how they would work as abrasives on gold sculpture, which she made in her spare time.

Also, most of the jumble of stuff in the drawer was as harmless and useless as it looked; anyone would have to take a very close look indeed to know that some of it was not.

Unfortunately, she mused, suspicion *would* have been aroused had she added a charged implant power-unit to the accumulation—and if things got really tight, she would doubtless need plenty of power in a hurry. She had an answer to that, of course, but it would have been better if . . .

There was a murmur of voices and footsteps down in the test chamber.

"If everyone will find seats," spoke an authoritative voice. "Thank you. Now, how are we on security, Marvis?"

"We're snug, Thydan," the voice of Marvis Jans replied. "The Gordeen people have done a good job of keeping this project tightly wrapped."

There as a murmur of appreciation, in which Gweanvin could make out Falor Dample's rumbled, "Thank you, Miss Jans."

"This room could not possibly be bugged, then?" demanded a voice she did not recognize.

"Not unless the Primgranese have developed an entirely novel technique," replied Marvis Jans with a touch of disdain, "which is most unlikely. And if they had, the likelihood of their both knowing of this project and getting an agent inside approaches zero."

"OKAY, Marvis," chuckled the man she had called Thydan. "I have one specific question: what about Rayeal Promton?"

"All clear there, and I might say Rayeal is drawing more security attention than she merits simply because she happens to match a particular Commonality operator in age and basic genetics. Admittedly, the question, 'Could Rayeal Promton be Gweanvin Oster?' is a tempting one to consider . . . and it has been—but just because it is such an obvious one the Primgranese command would not have sent in the Oster woman on an assignment where . . ."

"They could have counted on us discounting our suspicions," put in Thydan, "for that very reason."

"Well . . . the important thing is that right now, she is forty-one floors above us working in her office and under observation from across the scrambleway."

"I'd like to be sure she'll stay there," grumbled the man who had asked about bugs.

"That can be arranged—if you think it's necessary," said Marvis.

"Good. Arrange it."

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Thydan said, "One point that bothers me about Miss Promton is that she has speculated accurately on the nature of this project and has discussed her speculations rather freely."

"She's a very bright girl," Marvis broke in. "If I were in her position, I would probably have drawn the same conclusions. And she has been discreet in her indiscretion—only with people such as her boss, and agents such as Don Plackmon and myself. Obviously she's playing give-the-security-boys-a-hard-time. We're used to stirring up a little resentment."

"If I may put in a word," rumbled Falor Dample. "Miss Promton's contribution to the project has not been a small one. Without her, that Bauble we're looking at might still be only on the drawing-board. That doesn't strike me as something to expect from an enemy agent."

"In any event," said Marvis, sounding impatient, "if the test which we might get around to after a while is a success, Monte can tell us very quickly if Rayeal Promton or anyone else on Narva is a Primgranese infiltrator."

"Good point," replied Dample. "Why don't we get on with it?"

"Very well," agreed Thydan. "Marvis, you'll alert Plackmon to keep Miss Promton confined?"

"Taken care of."

"Good. Mr. Dample, as chairman of Gordeen Consolidated, I believe the honor of pushing the button is yours."

And that, very suddenly, was *it*. The loss of her preferred escape route could not concern Gweanvin now. No tenseness over that or anything else. The task at hand required totally relaxed attention.

She entered fully into the Bauble for the first time. It felt different from Primgranese Baubles, partly because this one carried no idents of previous ego-field entrants, and partly because it *was* different on the physiochemical level. She felt an instant of relief at finding no idents there. If somebody around the lab had broken the rule forbidding entry in the Bauble she would now be open to telepathic contact with that person, and he could have blown the whistle on her.

Immediately she turned her attention to the portion of the surface touching the interface. Glowing bright traceries filled her mind. *Beautiful!* But this was no time for esthetic appreciation. What were the shapes of those traceries? What made them? How did they function?

And what did they remind her of? Some natural structure . . .

She allowed herself no awareness of seconds passing. Taking time to observe that this was taking too long would have made it take even longer.

When Thydan spoke, his voice came dimly to her, and its content made no impression: "Readings in-

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dicate optimum operation. Now I'll comm Orrbaune to turn on their end."

Were the traceries like the optical-synapse interface? The summation of thousands of retinal cell messages into a coherent visual scene? . . . No . . . Something else . . .

Auditory! The complex interconnections of cilia nerves, involving feedbacks and resonances and a dozen other phenomena that enabled a listener to distinguish subtle variations in pitch and quality of sound. That was it! . . . In part, and not exactly.

Gweanvin kept at it until the whole picture clarified. She knew the nature of the interface and could guess from that the parameters of the comm system behind it. She could break contact right now, sabotage the Bauble and head for home at the earliest opportunity. It would be easy enough to get a vacation after the test proved a "failure", and back in the Commonality she could write out detailed instructions on how to build a Bauble-to-Bauble comm system . . .

AND that system wouldn't work. That realization came almost intuitively from her grasp of the characteristics of the interface. It wouldn't work.

Which wasn't the same as saying it *couldn't* work. It could. An ancient automobile with a defective starter could work, but wouldn't—

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until someone gave it a push to start it. The same was true of this system. There was near-complete randomity of orientation of the tiny, fine-texture fields of the interface traceries. This would prove extremely resistant to any flow through the system, too resistant for a flow to move.

But given the right kind of push, the fine-texture fields would align and resistance would vanish.

What kind of push, though? And by what . . . or whom?

Gweanvin could not even guess at the answer to the first of these questions. But the answer to the second was obvious.

She could not pull out of the Bauble yet, she realized. A vital question was still unanswered. She had to stay . . . perhaps until it was too late to pull out at all . . .

She stayed. But at the same time she started her body through a previously planned program of activities that could be carried out with minimal mental supervision. Her hands twisted off the top of the light-pen and her fingers deftly plucked out the instrument's control assembly and minipower unit. Next, the zercrown was brought out of the drawer, slid over the point of the light-pen, and taped in place.

"Orrbaune's switching on immediately," Thydan reported. Gweanvin kept her attention spread over the interface glow, watching for any change.

Now her fingers were wiring the device with strands of superconduct equipped with ready-weld tips. The two loose ends were then attached to insulated probe-needles.

The interface was beginning to alter in an area near its center. Something was happening there. Gweanvin moved in tightly on this area. Yes, it really was something like a push coming from the other side . . .

Her hands had left the finished device on the console and had picked up the two sheets of warprag. Her body had stood up and was walking toward the door.

. . . and in a way the push resembled a magnetic field. It was swinging the fine-texture fields into consistent orientation. But how was it doing this, specifically? . . .

Her fingers separated the two sheets of warprag, and her hands slapped the exposed active surfaces into position, overlapping the edge of the door and the door frame. Absently, like a well-rehearsed piano player with a wandering mind, she watched her hands press firmly against the sheets, imbedding their grip. Only a powerful smashing could force the door from the balcony side while those warprags remained in place.

. . . Ah! She was getting it! Monte was coming through! And for the instant he was too occupied opening up the interface to notice what lay beyond. Gweanvin *watched* him work. She saw how it was done . . .

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Her body had returned to the console. Her hands picked up the probe-needle contacts of her device and plunged them through the flesh under her ribs on her right side, seeking and finding the terminals of her main power pack imbedded there.

. . . *Anger!* A flash of anger now and she would have the job finished. But emotions, while controllable, work more slowly than clean thought. The split-second required to work up a burst of rage was too long. Monte spotted her. *Damn!* Her rage flooded out in a quick spurt and was gone. And so, of course, was contact with Monte . . .

"SECURITY break!" Thydan was yelling. *"It's Gweanvin Oster! I caught a thought from Monte! The Bauble's dark!"*

Gweanvin grinned as she pointed her device at the wall of her office opposite the door and activated it. A thin, superhot laser-beam flashed from the zercrown, cutting a curving slash in the wall as the device kicked in her hand. For an instant her shield screen turned on automatically to protect her from the intense backflare. She had pulled out of the ruined Bauble, but was keeping a light contact with its sound-sensitive surface segments which, not being destructible by emotional overload, were still functioning.

"I'm going after her!" came a grim bark from Marvis, as Gweanvin re-aimed and made another curving cut through the wall. The curves came together at two points, and a two-foot-wide slice of metal-mase teetered for an instant and fell outward.

Gweanvin had semi-inerted and slipped through the opening long before the chunk of wall reached the ground. She streaked upward from Narva as fast as atmospheric resistance against her shield screen would permit.

"Alert the Guard!" came Thydan's voice. "She's out of the building and getting away!"

"What happened to the Bauble?" came the rumble of Falor Dample.

"How should I know?" Thydan returned bitterly. "Among those major contributions of hers you were just praising was a twist she didn't bother to tell you about! I'm trying to get a report relayed from Monte. Maybe he knows what happened."

Gweanvin allowed herself six seconds of unswerving upward flight before taking evasive action. She figured on that much leeway before the Guardsmen could mount an effective response to the alert at upper-atmospheric levels. Out in open space, which she was fast approaching, they could react quicker, but so could she. She kept her laser device ready for use. It was clumsily small as a hand weapon and wasteful of energy, so low in resistance as to act as a virtual

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short-circuit across her power implant. It was no match for a zerburst pistol, though it worked on the same principle. She hoped she could get away without using it again.

"Monte says she knows how to work the interface!" came Thydan's alarmed voice. "And she may be listening to us! Let's get out of this room!"

IV

GWEANVIN pulled away from the Bauble completely. It wasn't a good idea to enter warpflight with the ego-field lagging behind the body, anyway.

She tongued her toothmike to her "father's" frequency. "Hey, Pops!"

"Hello, Rayeal," the reply murmured in her left ear.

"Cover's blown, Pops. Out."

"Thanks, Gweanny. Out."

That warning would give her "family" members a chance to scram before Lontastan counter-espionage teams closed in on them. But she was the one the heat was really on. That report relayed from Monte to Thydan would make it plain that she had information she must not be allowed to carry to the Primgranese Commonality. The Guards had probably been ordered to shoot on sight . . .

One of them did. Just as she was passing the forty-mile altitude level the flare from his zerburst pistol sparked less than three miles to her left. She caught a quick glimpse of the ionized trail of the beam leading to the flare. It hadn't missed her by more than fifty feet and wouldn't have missed at all if she hadn't made an evasive zag less than a second earlier.

She risked a mini-warp—dangerous in the atmospheric fringe—and came out of it seventy miles higher, with body and ego-field still together. Her detector immediately revealed half a dozen guardsmen within range. She had warped into the middle of a platoon! She quickly warped again, and came out to see a spectacular display of flares blossom around the spot she had just vacated.

Nobody was close enough this time to get a good shot at her, but her detector showed the sky was now full of Guardsmen, above, below, and on all sides. This was a time to scoot, she decided, not to stand and fight. She would have to risk going into warp and staying there.

She did so . . . and got away with it. No body/ego-field dissociation that came when one warped through a too-dense wisp of gas or dust, wisps that were always drifting unpredictably about the near vicinity of stars.

Now the sun of Narva was shrinking to a pin-point and she was safely through the gauntlet of Guardsmen—thanks to the fact that the alarm had not gone out

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until she had escaped from the Gordeen building and was on her way. Two seconds later and she would not have made it.

She would be pursued, of course, and Guardsmen from other Lontastan worlds would be swarming out to try to intercept her. But interstellar space was vast, and she possessed less mass than any of the Guardsmen—neobarbs were all big men—and therefore had a higher sustainable warp velocity. She'd be hard to either catch or head off.

Nevertheless, she knew she could not make it to the Commonality without help. The necessity of cutting her way out of the Gordeen building had made that impossible. Those two blasts from her makeshift laser knife, brief though they were, had drained an awesome amount of power from her pack. Those packs weren't designed to be stingy; often a person in an emergency needed plenty of juice in a hurry, and a pack would supply current at the rate needed . . . while it had current to supply.

But on a short-circuit discharge, and especially through superconduct wiring, an implant pack could be drained completely in ten seconds or less. Gweanvin's pack had not been fully charged to begin with, and had been on short-circuit for a good three seconds. It was, she guessed, at something less than half capacity now.

And the Commonality was a long way off. Narva was located at the far side of the Lontastan Federation, and that put her home ground some twenty thousand light-years away, with nothing but unfriendly territory in between. Perhaps she had power for two-thirds of that distance.

There was, however, no point in heading in the other direction, into the unsettled region of the galaxy behind the Lontastan worlds. That region had been explored for quite some distance. There were planets on which she could play a female Robinson Crusoe for the rest of her life, but that was all.

There was just one destination within reach that made any sense—the Halstaynian Independency.

The Independency lay roughly between but somewhat to one side of both the Federation and the Commonality, and bulged on the Federation side in the general direction of Orrbaune. It was not a participant in the econo-war, having been settled by people who viewed competitiveness with distaste, as a childish and demeaning habit man should have given up long ago.

Gweanvin shared the majority view of Halstaynians—that they were somewhat less than half alive and getting moreso every year. But when somebody from the Commonality or Federation went into the Independency, which was not often, the Halstaynians were friendly enough—if in an absurdly condescending manner. And from

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:re she certainly shouldn't have y trouble getting her pack re-arged and returning to the Com-)nality.

The important point was that she d the power to reach the Inde-ndency.

After a moment of consideration, e threw away her laser device. It is her only excuse for a weapon, t it was also mass, and if she ade it out of Lontastan territory, e would do so by running, not by hting.

Next she considered her clothing, it her flimsy blouse and shorts ally had too little mass to make scarding them worthwhile. The me was true of her sandals. As r her belt and pouch, they had ass but could not be parted with. ie had to have something in which keep her food pills, if nothing se. However, she went through e pouch and threw away every-ing in it she could possibly do ithout.

After that she broke out of warp omentarily, got herself coordinat-l on a star beyond which was an ntry through the gas cloud banked n this side of the Independency, nd returned to warpflight on the ew course.

Then there was nothing to do but :lax into dormancy from pill-time) pill-time, for the several standard ays the journey would take. And espite the all-out search the Lon-stans were making, this routine ent undisturbed.

THE gas clouds that lay between the Halstayne Independency and Earth accounted for the Independency's existence. As humanity began spreading out among the stars, forming the colonial societies that eventually became the Primgranese Commonality and the Lontastan Federation, the explorers moved along the edges of the clouds without attempting to penetrate. Much later, when gas-free passageways through the clouds were found and charted, neither the Commonality nor the Federation saw much potential in the hard-to-reach handful of habitable worlds the clouds concealed.

These worlds went more or less by default to the individuals and small groups who, for various reasons, wanted no part in the econo-war. Gweanvin had never felt much affinity any such drop-out philosophy; in fact, she had never visited the Independency before. But it was part of her job to know her way about the inhabited portion of the galaxy. She had learned the charts of the passageways through the clouds, and the locations and descriptions of the habitable worlds within.

Also, she knew enough of the down-hill history of the Independency to have some idea of what to expect on those worlds. No more than a century ago, when fair numbers of people were still moving ino the Independency, it was a fairly successful society. But of late the

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movement had been in the other direction. The more capable Halstaynians were realizing that a society that forbade the competitive spirit was, in essence, a denial of the basic nature of man . . . of life in general, for that matter. And being unrealistic, that kind of society had to either change or fall.

The Halstaynians who could see this flaw for what it was usually found their personal solutions to it by immigrating to the Federation or Commonality, rather than staying home and pushing revolutionary reform against an opposition composed principally of a formidable mass of public inertia. As a result, the Independency as a whole had rusticated. It no longer even tried to keep up technologically with the econo-warring societies. What technology it had once had was falling into disuse. The population was dwindling.

All of which was all right with Gweanvin. If that was the way the Halstaynians wanted it, she mused, that was the way they could have it. All she asked was a simple recharge of her power pack—and surely that much technology was still left.

She was more than halfway through the series of short, zigzagging warps required to follow the charted passage through the cloud when she felt a warning twinge in her side. The power pack was advising her it was ninety per cent drained. She grunted. But at least she knew now precisely how much power she had left, and ho stingy in its use she would have t be.

No corner-cutting was advisabl going through the passage, how ever. When she came into view c the Halstaynian suns she calculate she had enough power left for on sizeable or two short jumps.

Okay, which planet was it to be Bernswa was reportedly the mos advanced Halstaynian world bu unless she had greatly underesti mated her remaining power it wa out of reach. And Felis, with so-so reputation, was barely withi range. The only world that could b called close was Arbora, which wa so far gone that the Halstaynian had blithely designated it a wilder ness preserve nearly fifty years ago

Gweanvin ate a food pill whil she pondered the matter. This wa a crucial decision. If she made th wrong choice, she could wind u stranded in space . . . and the Hal staynians might not have a func tioning space-rescue service thes days. Or, if she went to Arbora, sh could be stranded there, too, i there were no functioning powe supplies.

She needed more information be fore deciding. She tuned her comm receiver to the open-broadcas channels and drifted in space fo several hours while she listened at tentively for a few useful facts There was little to hear excep music, most of it ancient, inter spersed with trivial gab. But there

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ere a couple of mentions of persons on Arbora, which assured her hat world wasn't totally deserted.

In any event, she decided it almost had to be Arbora, because of he possibility that she was overestiating her remaining power. That ould be the only world actually ithin reach.

She was making the painstaking alculations needed for a precise arp when a bogie flicked into xistence, a small glowing spot on he detection field surrounding her ead. Whoever it was couldn't have een more than a thousand miles way, she saw, suggesting that it as someone who had followed her hrough the cloud.

A Lontastan agent on her tail? ery likely, indeed.

Gweanvin had gone full inert hile listening to her comm, to save trickle of power. Thus, she would ot be as visible to the bogie as the ogie was to her. In fact, she might asily be mistaken for a chunk of pace debris, so long as she remaind inert.

She played possum and watched. couple of minutes passed, and ne bogie flicked out, the person aving warped off. But others ight be following, so she continud to watch.

Nobody else appeared, which as a bit puzzling. Was that bogie single Lontastan agent, playing a ne hand on a hunch? Well, if so, weanvin herself had a hunch who ne agent would be.

She had left clues enough behind to give somebody as sharp as Marvis Jans a clear hint of what might have happened. Marvis would know that she hadn't blasted her way out of the Gordeen building with a zerburst pistol, for the obvious reason that as a security measure hardly any such weapons were allowed inside the building. Marvis would have accounted for those weapons quickly. Then she would have checked (if she hadn't already) to be sure the building's energy outlets were fused against short-circuit overdraws, also as a security measure.

And Marvis would therefore conclude that the likelihood was very good that she had used her power pack implant, for lack of any other sufficient source, to blast through the wall. A little more checking would reveal how long it had been since Gweanvin had gotten a recharge. Marvis could then guess she would have to head for the Independency as the only non-enemy territory within reach.

But it would be a guess, not a sure thing. And it would be like Marvis—or like herself if their positions were reversed—to play the guess on her own.

Would Marvis investigate Arbora first?

Perhaps. The agent's movements were not predictable. She could see no percentage in delaying planetfall any longer. The sooner she was on the surface of a world, the sooner

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she could make herself impossible to find.

SHE warped for Arbora . . . and missed. Only by some two hundred thousand miles, but that was enough to require a mini-warp approach jump. This brought her within five hundred miles of the surface. There she went full inert and let Arbora's gravity bring her down, knowing she would be less noticeable that way than in a semi-inert approach, and also would use less energy.

When she hit air her shield screen reacted automatically, protecting her from friction and heat, and spreading into a wing conformation to slow her fall and give her steerance. Not that it seemed to matter where she landed . . . all was field and forest below, with no indications of where the people might be.

She angled toward a small grassy valley as she neared the surface, waiting until she was down to one hundred feet before trying to go semi-inert to soften the landing. Nothing happened when she did. She came down with a jarring thump, slowed only by ground-effect compression of the air between her shield and the surface at the last instant.

She rolled over and sat up in the long grass. Her shield was off, and her respiration had gone on normal exterior mode.

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Once more she tried to semi-inert, without result. Which could mean only that her power pack was totally drained. Just to be sure, she tried the shield screen again, and it did not respond.

She was definitely on Arbora until she found a recharger, and she would do her searching for it on leg-power alone.

But more urgent was the subject of food. The instant her breathing had gone external, bringing her the varied aromas of field and forest, she had become ravenous. She had been on the food-concentrate pills and stomach balloon for an uncomfortably long flight, and needed something solid.

She stood up and walked through the tall weeds to the small brook that gurgled through the valley, her eyes searching for anything edible. Arbora had, she recalled, a seeded Earth ecology—which obviously had turned out better than most other Halstaynian experiments. She recognized a number of briars and bushes that produced edible fruit in season, but the coolness of the air and the yellowish hues of the not-distant eaves of the forest told her this was not the season. It was autumn in this region of Arbora.

At the brook she knelt and drank, and splashed her face with the clear sweet water. Standing, she considered following the brook downstream, but the thick growth of brambles and weeds would make difficult walking. Instead, she headed uphill toward the nearest trees.

There her luck improved. Some of the trees were hickories, the ground beneath them liberally sprinkled with small nuts. She spent two hours smashing their tough hulls between two stones and picking out and eating their tiny but rich kernels.

Then she moved on to a rocky bald on top of the hill. It was late afternoon by now and she scanned the horizon in all directions, searching for a wisp of smoke or any other sign of human presence.

"*Hey!*" she yelled at the top of her voice: "*Anybody home?*"

The startled birds in her vicinity obligingly ceased their chirping while she listened for a reply. Nothing.

She turned around and yelled again with the same lack of results.

So . . . start walking—or try to build a fire and some kind of shelter for the night. The low position of the sun made her choose the latter.

Try to build a fire . . .?

The quickest way was to strike a spark between rock and metal into easily-lit tinder, but she had thrown away everything metallic when she cleaned out her pouch. She tried hitting rock on rock instead, but the stone thereabouts was wrong for the job. It crumbled instead of sparking.

So . . . she would rub two sticks together, making a groove in one

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with the end of the other.

She tried that for a vigorous forty minutes and was surprised when the groove finally began smoking. She dumped the spark into a handful of cedarbark fiber she had gathered and fanned it into flame. A few minutes later she had a roaring fire going.

For a while she sat beside her fire, resting her arms and rubbing the fatigue out of them as twilight deepened. Then she rose and began searching the nearby trees for pine and cedar boughtips to break off for bedding. That would be better than a mound of dry leaves, which were certain to be insect-infested.

V

"HEY! Was that you yelling a while back?" a man's voice called out of the gloom.

Gweanvin turned, trying to see him. "Yeah . . . I didn't hear you answer."

"I was stalking a deer at the time. Couldn't make noise," the man explained. His form moved closer to the fire, and she saw he was carrying something large over a shoulder which he heaved to the ground a moment later. "I finally got within bowshot and brought her down. Then I started looking for you, and saw your fire."

He turned to look at her, and she could see his face dimly in the flickering light. He was clean-shaven, which she had not expected from a buckskin-clad man of the wilderness, and appeared to be in his thirties.

"Looks like you've strayed a long way from home, young lady," he said. "You from Bernswa?"

"Farther away than that. The Commonality," she replied. "My power pack's exhausted. I had to land here to get a recharge."

"A recharge on Arbora?" he laughed. "Well . . . probably you can, at that. There ought to be a few rechargers scattered about. I don't know for sure, though."

"You don't know?" demanded Gweanvin. "Where do *you* go for a recharge?"

He chuckled. "The only thing I recharge is my stomach. And I'm about ready to do that right now, if you'll let that fire die down to a bed of coals fit to cook over. You hungry?"

"I'm starving."

"More than plenty for both of us." He slid the large backpack off his shoulders and busied himself with knife and deer carcass.

"Then you don't have a life-support system?" she asked.

"Just Arbora. No implants. I guess that sounds primitive to you, doesn't it?"

"It sounds restrictive," she said diplomatically, not wanting to offend the source of her supper. "Doesn't anyone on Arbora use implants?"

"A few do. That's why I say you might be able to get a recharge.

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There's a settlement called High Pines about five days hiking west of here, and about eight days to the southeast is Lopat. You could almost call Lopat a town, I suppose."

"What's in between?"

He shrugged and motioned vaguely at the surrounding woods. "Just this. Good hunting country. And not many hunters. I don't average running into somebody three times a year out here."

Gweanvin considered this information. At last she said, "Then I'd better start walking for High Pines in the morning, if you'll tell me the way."

"Sure." he agreed. "Or maybe you should head for Lopat. It's a longer trip, but . . . well, I can't say for sure which place is more likely to have a recharger, but I'd guess Lopat is."

There was a silence. Gweanvin was waiting for the man to offer some assistance in her search, perhaps hiking to Lopat while she went to High Pines. But he made no offer. Perhaps the primitive life deadened the chivalrous inclinations . . . or perhaps he needed to know her better to exert himself in her behalf . . .

"My name is Gweanvin. Gweanny. Gweanvin Oster."

"Glad to meet you, Gweanny. I'm Holm Ocanon."

"There are a lot of Ocanons in the Commonality," she said.

"That's nice," he said. Which was a conversation-stopper if ever she had heard one.

WHEN supper was ready they sat by the fire eating the broiled meat strips, roasted roots too fibrous to be potatoes but with a pleasant nutty flavor, and some kind of raw greenery Holm had had in his pack. Also he had brewed a bitter tea that was invigorating, and might have actually been tasty with a little sugar.

"I have a blanket you can wrap yourself in," he said. "As near naked as you are, you'll sleep mighty cold without it."

"Thanks. It seems strange to need a blanket on a comfortable E-type planet, when ordinarily I'm perfectly comfortable just like this in interstellar space. It's easy to take life-support for granted."

"I imagine so," he mused. "It's easy to take living conditions of whatever kind for granted. And some conditions are less dependable, less stable, than others."

"Yours seem stable enough, but awfully strenuous," she said. "Wouldn't life in or near one of the settlements be easier?"

"Yes, and wouldn't life in the Commonality be easier without the econo-war?" he returned.

"Too much easier—as we found out a few decades ago when the war got too one-sided and almost ended."

"Yes, that was after the Lontastans found the non-human telepath

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they call Monte, and brought him in on their side," Holm said. "We heard about that. Then your side developed the Bauble to even the sides up again."

"I hardly expected to find an econo-war fan here in the Arbora wilderness," she said, smiling.

"People are interested in other people's games . . . to watch if not to play," he said musingly.

"That's true," Gweanvin replied. "For instance, I'm interested in your game, and why you choose to play it. I would think the game of family-raising near one of the settlements would have more appeal for an Arboran, and be plenty challenging."

He nodded slowly. "I'd be playing that game if I could."

"Why can't you? A shortage of women on Arbora?"

"No. I could get the women all right. I can't get the children."

"You look like a thoroughly functional male to me," said Gweanvin, still hoping to recruit Holm's aid with a bit of flattery.

He laughed. "I feel like one, especially with you sitting next to me. But just the same, I'm out of whack, somehow. I don't reproduce."

"Oh . . . That's a problem I know a bit about."

"Probably you don't. It's not simple sterility. We still have medical treatment here, to take care of problems like that. No . . . I seem to be too different . . ."

Gweanvin started. "D-different? In what way?"

"Well, if there was enough light for you to see my nose, you might notice a bony look, because—"

She slipped close to him. "Let me feel it," she breathed.

"Why . . . sure! Go ahead," he laughed.

Her fingers found his nose in the dark, and explored its ridge. Solid bone was underneath the skin! Just like her own nose! And Marvis Jans'!

"Oh, golly! Wow! Oh, golly!"

He laughed again. "My nose doesn't usually get such a flattering reaction. What's so thrilling about it?"

"Your turn to feel my nose!" she giggled. As he did so she kept giggling. "This beats everything! We search the files of the Commonality and the Federation, cybernetically examine the genetic profiles of billions of people. Then I land on Arbora of all places, and who walks up to my fire first thing! Oh, Holm, this is a miracle! I've found you!"

Holm sat without moving or speaking for a long moment, apparently stunned. Then he grunted, "Damned if you haven't!" and took her in his arms.

WHEN Gweanvin woke the next morning Holm was gone, but his pack was still there. She found some live ambers in the ashes of the fire, and succeeded in blowing

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some twigs into flame. Then she went down to the brook for an icy bath and was back at the fire warming herself when Holm returned. He was carrying a roughwoven bag that Gweanvin hoped contained breakfast.

"Hi," she chirped. "Been hunting?"

"Yes," he grinned, kissing her lightly. "More than hunting, really. I left you shortly after midnight. Did I wake you?"

"No." She had felt him leaving, but had not come fully awake.

"I wanted to check on a cabin that's a couple of hours walk from here," he explained. "I suppose it's been deserted for a century but it's in good condition. We can use it unless you want to be closer to a settlement."

He took utensils from his pack, some large brown eggs from the sack he was carrying, began working on breakfast.

"Holm, I can't stay," Gweanvin said softly.

He hesitated. "What's wrong?"

"An obligation. My job in the econo-war. I'm a spy-saboteur for the Commonality. I have to go home to report on a matter that could be crucial to keep the war in balance. Somehow I have to get my power pack recharged, and do that. Then I can resign and come back."

Holm put the teapot on the fire and began cutting fat into a frying pan. "How long will that take? A couple of months?"

"More like three years I'm afraid. You see, the critical part of my report involves a technique that I've seen employed, and that I can do myself but can't describe verbally. I'll have to *show* others how it's done, and some special equipment will have to be built before I can do the demonstration. That's what will take time."

After a moment, Holm nodded. "Okay, Gweanny, I won't give you any argument—except that I don't want you giving birth to a child of mine in the Commonality."

"Don't worry," she giggled. "I'll wait till I get back for that."

"And you can't do anything until you're equipped to travel on foot through the forest," he added. "You need a bow and training in how to use it to bring down game. You need warm clothing. We should stay here at the cabin for at least three days getting you prepared. Then you go to High Pines while I go to Lopat. That's the fastest way we can find out if there's a recharger at either settlement. We'll meet back here. Okay?"

"Fine. But there's one thing you should know, Holm. I'm sure I was pursued into the Independency by at least one Lontastan agent."

He nodded. "Right. I'll keep my mouth shut about you—but there's probably nothing to worry about. The people here won't cooperate with the Lontastans, of course. And Arbora would be the last planet

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your pursuers would expect you to land. Even then, there are thousands of villages on Arbora, in all of which they would have to make inquiries. I'd say they don't stand a chance of finding you until after you're recharged."

"That's good to know," she said gratefully. But what pleased her most was his assumption that there were several agents on her tail—not just one female with a big bust and bony nose. Above everything, she could not allow Marvis Jans and Holm Ocanon to find out about each other. Thank goodness, the likelihood of that was slight with Holm out of communication this way, playing his game of self-sufficiency in the wilderness.

But even Marvis Jans' presence in the Independency was in itself more of a risk than she was willing to accept. She resolved that when she resumed her homeward journey she would make sure Marvis pursued her right out of the Independency.

THE three days at the cabin passed swiftly and busily. She had much to learn before undertaking a two-week trek alone . . . how to handle the bow Holm made for her, how to find edible vegetables in field and forest, how to quickly build a shelter that would keep out most of the rain. She was a good student, however, and often asked questions that gave Holm pause.

Perhaps, she mused, there was no such thing as a completely expert woodsman. Holm, who had lived in the wild most of his adult life, seemingly had missed many points.

He was often away from the cabin for stretches of ten or more hours, ranging far among the scattered derelict habitations in search of bits of equipment she would need. His finds included a good knife, a chunk of sound velveen fabric from which she made herself warm trousers and jacket, a few pots and pans, and a flint and steel for firemaking.

Then one clear morning they began their separate journeys, she heading west and he southeast. She had a roughly sketched map Holm had made for a guide, showing the major landmarks on the way to High Pines with a line indicating the best route to follow.

Even with that help, it was a tough trip. Gweanvin guessed it had been years since Holm had actually traveled this particular course, because she kept coming up against impassable thickets and bogs that must have formed since then.

What he had described as a five-day hike turned out to be seven. But at last she came to the settlement of High Pines—some two dozen houses in a loose cluster under the trees with a scattering of cultivated fields nearby.

There she was welcomed with hospitality, a couple of good meals,

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and a cozy bed for the night.

But no recharger.

Did they know if there was a recharger in Lopat, or anywhere else nearby?

No . . . they weren't sure. Only seven of the villagers had life-support implants, and didn't use them much. The last person there to get a recharge had gone to the planet Bernswa for it—and that was seventeen years back.

The picture wasn't encouraging as she began the long hike back to the cabin. The chance of Holm finding a recharger in Lopat seemed slight indeed from what she had learned.

Well, if that meant she was stuck here indefinitely, then the econo-war would just have to get along without her. Perhaps getting the new breed started would have more long-term significance anyway.

And she *could* get home at some indefinite time in the future. A couple of oldsters in High Pines had told her that; when one of them died she would be welcome to salvage his partially-charged power implant from his corpse.

Both of them were discouragingly spray and healthy. She wondered how much use her report would be to the Commonality, if it didn't arrive until twenty years from now.

HOLM was waiting for her when she reached the cabin. "Poor Gweanny," he murmured, taking her in his arms and kissing her. "You look exhausted."

"I can believe it. Did you . . . have any luck?"

"Yes, I brought a recharger back with me," he replied, surprisingly. "It's inside."

"Wow! That's a relief! From what I was told in High Pines, I wondered if there was one this side of Bernswa!"

"At least one," he smiled, giving her a squeeze, "and you've got it."

"Golly! I don't know how to thank you, Holm!"

He grinned. "Maybe I'll think of some way."

"I get the impression you're not as beat as I am," she laughed.

"I shouldn't be. I got back three days ago. Been taking it easy ever since."

"How did you manage that?"

"I was given a lift by a fellow in Lopat, the man who loaned me the recharger. He wanted to know where I was taking it, anyway, so he flew out here with me riding on his back."

She thought about it for a moment. "Doesn't *that* compromise the location of our little love-nest?"

"Not really. I know that guy. He won't talk to any Lontastan agents about us."

"Had any agents been in Lopat?"

"I don't think so. Of course I didn't ask, but someone would have been likely to mention such unusual visitors."

Gweanvin nodded, and asked no

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further questions. Holm hadn't been as discreet as she would have preferred, but then he wasn't a frontliner, experienced at disclosing not one datum more than he wished to disclose. Considering his backwater background, so far away from the econo-war, he had done very well indeed.

THEY entered the cabin and he brought the recharger out of a closet. It was a large clumsy device, in a plastic block. It weighed at least twenty pounds, typical of the comparatively unpolished technology of the Independency of a century ago.

But it worked. It generated energy. Gweanvin punched its probe-needles through her skin to the contacts of her power pack—rather gingerly because the needles were painfully dull—and thirty minutes later she had her recharge.

"When are you leaving?" Holm asked.

"Soon . . . tomorrow morning. I really must, Holm."

"Okay. I'll hate to see you go—but you know that."

"Returning will be more pleasure for me than leaving," she said. "And Holm, I don't want you to see me go. I would be best if you were far away from the cabin before I go on power."

"Oh . . . in case the Lontastans spot you leaving and follow your backtrail?"

"Yes. My light weight makes it possible for me to outwarp any agent I ever met, so the chances of my being caught are slight. But there's nothing to stop the agents from coming here and questioning you."

He laughed. "A lot I'd tell them!"

"You could wind up telling them more than you intended," she said grimly. "You know no more of their tricky games than I knew of woodsmanship—and if they find out I'm coming back . . . well, you can kiss our plans for a long and happy mating season goodbye."

After a moment, he said slowly, "I'll leave around midnight, Gweanny, just as I did the first night. When you go, I'll be more than twenty miles away."

HE WAS gone the next morning. Gweanvin prepared a large breakfast and ate it slowly. She was in no hurry to lift off, since each moment of delay now would put Holm farther away. Of course it was not really likely that she would be backtracked, but she did not want to take even a slight risk of bringing Holm and Marvis together.

She was not, she realized, being completely reasonable on that score. But neither would Marvis be, if their roles were reversed. Had she and Marvis been devoted sisters, perhaps they would willingly share the only available male of their species. But they were not. The ex-

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pediencies of the econo-war could not be left out of the picture. She and Marvis were competitors, and frontline competitors at that, which meant they were among the relatively small group of econo-warriors who might, on occasion, carry the conflict to the point of shooting at each other.

Sharing the available male would be reasonable. It would be the surest way to give their new species a toehold on continued existence. But circumstances did not really allow her to be reasonable . . .

. . . Not even if she wanted to, which she didn't. She grinned. It was such fun to outdo Marvis of the big bust!

Not that Holm was . . . well, was her *ideal.* Gosh, he was close to sixty Standard Years, old enough to be her father! Even though, by the homo sap norm, he only looked thirty. Of course he doted on her; he made that all too obvious. Letting her have her way about everything, instead of forcefully taking charge. For instance, letting her leave for three years, or maybe even longer, without the least ruckus, although he plainly hated the idea.

Oh, well. It was too much to expect the one available male would be someone she could fall madly in love with. At least she found him attractive enough for all practical purposes. And he *would* make a terrific father, here on Arbora. She had sized his woodsmanship up wrong earlier, because he had trouble teaching it to her. But that was because he hadn't ever bothered to verbalize a lot of what he knew before.

The things that man could do . . . the success he had had scrounging equipment for her trek to High Pines . . . and that bow he had made for her, as good or better than any wooden bow that could be bought in a Primgran sporting goods shop . . . and these lovely breakfast eggs she was eating. Despite his instructions, she hadn't yet been able to find a wild chicken nest, but when Holm went egg-gathering he always came back with a sack of beauties.

And if he was lacking somewhat in youthfulness and forcefulness, he was nevertheless plenty masculine. And with him sex could have a purpose beyond play. She suspected that difference alone would hereafter make dalliance with homo sap males too trivial to bother with.

What was that quote she had noticed in that ancient treatise on the experimental crossing of donkeys and horses to produce mules? Oh, yes:

". . . *it is a curious fact that once a male donkey has served a female donkey, it is often reluctant to transfer its attentions to a female horse.*"

A "curious" fact, indeed. Seemingly even donkeys have an intuitive preference for producing a viable strain of offspring . . .

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VI

She rose from the table and prepared to leave. That consisted mainly of removing the warm velveen clothing which would no longer be needed when she went on power. She walked through the cabin and paused, looking at the bow Holm had made her. It was a handsome piece of work, and she was tempted to take it and a few arrows along as mementos.

Well, why not? If Marvis Jans were still around, she wanted to lead her away, didn't she? The extra mass of the bow ought to slow her just enough to keep Marvis from growing quickly discouraged.

She slung it across her shoulder and tied the quiver of six arrows to her belt.

Gweanvin stepped outside, took a final glance around, then semi-inerted and activated her propulsion field. Rapidly she soared up into the clear morning sky, lifting directly away from the planet, enjoying the physical comfort of having all her life-support systems going again and the freedom of motion which could come no other way.

Her detectors showed a spot of activity off to the southeast . . . the settlement of Lopat, she guessed. Nothing showed at High Pines; none of the few possessors of life-support systems there were using them at the moment.

There were no signs of pursuit yet. She had not expected anything this quickly. Marvis might well have stationed herself near Arbora by this time, working on the assumption that if Gweanvin were still in the Independency at all, it was because she was on a planet where a recharge was hard to find. In short, on Arbora. But Marvis wouldn't be on the ground. She would be in space, ready to pounce on Gweanvin when she emerged from the atmosphere.

Gweanvin hoped she would be waiting for her. That would save the trouble of buzzing every planet in the Independency looking for her.

Soon she had cleared the atmosphere, and immediately went into warp toward an opening in the gas clouds that led into the Commonality. Within two minutes she was sure Marvis had not picked her up.

She frowned in thought. Was it really worthwhile to search the Independency for Marvis, when the Lontastan agent might even have given up the chase by now and returned home? Or, if not that, might be waiting in ambush at one of the warpshift points in the cloud crevice ahead?

It would not, she decided. If Marvis wasn't hanging around Arbora itself, what chance was there that she would encounter someone who would say, "Hey, I know a guy with a nose just like yours"? Almost no chance at all.

So the only real risk was that

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Marvis *was* near Arbora, but Gweanvin's quick departure had caught her napping. Or perhaps the planet had been between them and had blocked out detection.

Well, that possibility could be checked out quickly.

Gweanvin reversed warp and went back to the Arbora system, overshooting the planet some thirty thousand miles. She had departed from the early-morning side, and now she hung over the early-evening side, studying her detector-screen.

Nobody was on power anywhere in nearby space. The only flickers came from the planet itself, and not many of those. Only one of those flickers was dopplering, indicating a person moving upward through the atmosphere. Marvis Jans? Hardly likely.

Gweanvin hesitated. Was there anything else to do before heading home? Well . . . not really. There came a time when the best thing to do was leave well enough alone and—

The dopplering spot on her screen flicked off, and Marvis Jans emerged from miniwarp less than fifty yards away. Before Gweanvin had time to react, the Lontastan fired her zerburst pistol.

AN INTENSE pain lanced through Gweanvin's left hip. She warped hurriedly, and the purring voice of Marvis came through the comm receiver in her left ear.

"Dear little Gweanny! Did I give you a nasty old hole in the hip? I'll try to do better next time!"

Gweanvin was busy shifting warp vectors, paying no heed to the diminishing pain in her hip. The maintenance units of her life-support system were already at work on the wound. Localized intensity of her countervac pressor screen had halted the bleeding almost as soon as it began, and within seconds internal reagents were forming walls of pseudo-tissues to contain organ ruptures for the hour or so that would pass before normal healing processes could replace them.

If, of course, she lived that long.

The zerburst beam had passed too close to her transport packet implant. The device itself had not been hit, but from the way it was malfunctioning she knew it had been heavily ionized. That was a self-correcting problem . . . given time. But for the present she was warping with the speed of a three-hundred pounder, and her miniwarps were breaking short of her projected exit points.

She couldn't outrun Marvis in this condition!

"I'm really sorry this has to be curtains for you, Gweanny," came the older woman's voice. "If I had a suitable alternative—but I don't. You're just too tricky to take chances with, dear. So . . . happy re-embodiment."

Gweanvin guessed Marvis' re-

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grets were sincere. Even frontliners hated to kill without ample reason. And Marvis knew she would be destroying half the female population of her own species. But Gweanvin could see her point. A Primgranese agent who had gained such vital information as she about Lontastan plans for expanding Monte's sphere of dominance could not be allowed to return home.

She continued miniwarping frantically, knowing Marvis would catch up with her quickly during any warp of more than a few second's duration. They were still in the system of Arbora, zig-zagging outward toward a type-J gas giant.

The failure of Marvis to kill her with that first shot was not due to lack of deadly intent. It came instead from Marvis having to warp in close enough to identify her quarry by sight, much too close for a zerburst flare. A zerburst pistol emitted a thin pencil of extremely intense light, so intense as to drill a hole through almost any substance it struck. Its intensity also created a linear warp along its length, resulting in trailing portions of the beam propagating more rapidly than the leading portions. When the back end caught up with the front, and the beam had theoretically no length at all, it became an unsustainable singularity that broke up in an instantaneous release of all its concentrated energy. That was the flare.

The more intense the beam, the quicker and closer the flare would be. But a pistol could not be so powerful as to produce a flare only a few yards from its muzzle, and in any event such a flare would vaporize the shooter as well as the target. So the worst Marvis could do to Gweanvin at recognition distance was drill a quarter-inch hole through her, without time to aim and make that hole deadly before Gweanvin reacted and warped away.

But now that the chase was on, the pistol would be more in the situation for which it was intended. Marvis could set the weapon's intensity to flare at a certain range, then bide her time until she maneuvered herself to precisely that distance from Gweanvin.

Perhaps, thought Gweanvin, if I can circle behind that gas giant I can lose her long enough to—

But again she dropped out of miniwarp too quickly. The condition of her transport packet wasn't improving. She caught a flashing glimpse of a large object off to her left and with no hesitation warped to put it between herself and her pursuer.

This time she had allowed properly for her malfunctioning implant. Her warp exit was less than half a mile above the surface of the object, one of the gas giant's airless minor moons. Immediately she went full inert, killing all power consumption except for pressor field and detector. An instant later

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the detector screen showed the spot that was Marvis flash quickly on and off several hundred miles up as the Lontastan agent jumped around searching for her. Gweanvin, under the gravitational attraction of the moonlet, drifted slowly to the ground.

"Very bright of you, Gweanny, dear," came the voice of Marvis. "Taking cover could add whole minutes to your life-expectancy."

Which was accurate enough, Gweanvin supposed as she touched ground feet first with an experienced knee-jiggle to prevent bouncing. All Marvis had to do was close in on the surface to a range where Gweanvin would be detectable, despite low-power usage, and circle on semi-inert until she spotted her target.

Gweanvin looked around for shelter, but saw no good hiding-place, no hole to crawl into. A rill-cliff, its top in sunlight and its base in deep shadow, was the best cover she could find. A few long leaps brought her into the shadow where she stood, back to the cliff, watching her detection screen.

A hell of a way to be caught, weaponless and with a loused-up transport implant, she told herself bitterly.

Weaponless?

SHE swung her bow off her shoulder and gave the string a testing tug. Surprisingly, the wood responded normally, as if it had been treated in the manner of professionally made bows against deterioration in vacuum. She wondered fleetingly how Holm had come to anti-space the wood, but this was a bit of luck too good to question.

She fitted an arrow to the bow and held the weapon ready, making sure that more arrows were poking handily out of the quiver for quick drawing.

A ludicrous situation . . . pitting a bow against a zerburst pistol. She snickered grimly at the thought. Why, Marvis could fire, miniwarp, and fire again while a single arrow was crawling its way toward her original position!

But if she could score a hit, the arrow would penetrate the agent's defensive screen. Though an arrow was light in weight, it still packed a lot of mass in relation to the size of its penetrating tip. More than a bullet did, or many other far more sophisticated projectiles that defensive screens were designed to stop. Its relatively low speed in effect would "fool" the screens into treating it as a minor threat, since the screen could not see all that inert mass behind it.

However, the only possible advantage she could expect from an on-target arrow was one of surprise, in that Marvis would not expect her to have any weapon at all . . .

And there was Marvis! She came into view and into detection at the

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same time, flying slowly over the top of the cliff and not far to Gweanvin's left.

Gweanvin raised the bow, drawing back the string, and released. Without waiting to see the results, and while Marvis spotted her and aimed her zerburst pistol, Gweanvin miniwarped right up from the surface to a point fifty feet above her enemy. There she went on inert propulsion and drove straight down at Marvis. There was a slight jar when her shield screen banged into that of the semi-inert Lontastan, and a bruising jar when her impetus slammed both of them down on the rocky moonlet, with Marvis on the bottom. A shield screen had to flex under such punishment.

VII

GWEANVIN sat up groggily on the spot she had bounced to, ten feet from where Marvis was stretched out. Where was the pistol? Oh, there it was, beyond Marvis. She leaped across the woman and grapped it just as Marvis began to stir.

Gweanvin tucked the pistol in her belt and watched the Lontastan warily. How knocked out was she? Badly hurt or playing possum?

Although she had no intention of aiding her traumatized enemy, Gweanvin exteriorized and moved into the woman to check on her injuries. That was something an ego-field could do far better than physical hands, because the care of bodies was a prime ego-field skill, and . . .

Stunned, Gweanvin withdrew and stood staring at the older woman.

Marvis was not badly mangled. A couple of broken ribs, a little internal bleeding, and an arrow through the left shoulder. Nothing her life-support maintenance system could not mend in a few hours, once that arrow was out of the way. After a moment, Gweanvin stepped forward and gently pulled the arrow free.

Oh, yes. Marvis would be fine. And so would her baby.

Pregnant!

By about two weeks, as near as Gweanvin could guess.

Oh, my, what a fine country bumpkin Holm Ocanon had turned out to be!

"Marvis," she said.

The woman roused slightly. "Uh-huh."

"You'll be okay in a little while. I removed the arrow. I'd better run along now."

Marvis managed to open her eyes and stare questioningly up at her. "Where are you going?"

"To the Commonality, naturally. I have a report to make, in case you've forgotten."

"Uh. See you again?"

"Not if I can help it. So long."

Gweanvin lifted off. She decided not to bother retrieving the bow she

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had left back by the rill-cliff. But before warping out of the Arbora system, she paused in thought. Despite what the pregnancy of Marvis told her, the point remained that she had promised to return in about three years . . .

She tongued her toothmike to nonspecific frequency and called, "Holm Ocanon?"

Silence.

"Speak up, Holm," she snapped. "I've caught on."

"Hi, Gweanny," his voice sounded in her left ear. "I'm sorry."

"I'll just bet you are!" she scolded, narrowing down to his comm frequency. "Quite a set-up you arranged for yourself. Not that I really blame you of course. Males of our species probably have polygamous instincts, just like homo sap, I suppose. Too bad for you your scheme didn't work. Wow, how you had it made!"

"Uh . . . how's Marvis?"

"Oh, don't fret! She's out cold at the moment, but she'll come limping back in a few hours."

"Does she know as much as you do?"

"Not from anything I said. But you won't gain anything from your masquerade now, Holm, so why not be honest with her?"

"Maybe I should," he replied glumly. "How did you catch on?"

"From her being pregnant. How stupid I was, admiring your woodsmanship! Wild chicken nests, indeed! What farmer did you buy those eggs from, Holm? Did you pick up that bow at a sporting-goods shop in Lopat, or did you have to hop on semi-inert to a bigger town to find it? Maybe a town halfway around the planet from where I was stuck, but close to the nest you shared with Marvis? Did you have to go all the way to Bernswa to pick up that recharger? Damn! No *wonder* that map you drew had me mired in bogs and scratched in briar thickets! The least you could have done was to survey it at a lower altitude!"

"Gweanny, I set things up like this because I'd given it years of thought, along with a lot of patient waiting for the right opportunity. Try to understand, won't you?" he urged. "We're a new species, too new to know what we really are, or even have a name for ourselves. We and our children should develop as much as possible on our own, not as members of the econo-war society of humanity. We should find our own paths and goals, Gweanny, as we can on a world like Arbora. Don't you see the reasonableness of that?"

"I decided earlier today not to be reasonable," she replied. "In any event, I don't see the reasonableness of starting our species off with personal relationships based on deception. Damn it, Holm, I wouldn't treat anybody but a Lontastan in the tricky, scheming way you've handled Marvis and me! I wouldn't . . ."

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She paused as another light dawned on her. "But of course, you'd be good at things like that, *as a former frontliner!* Were you Primgran or Lontastan?"

"Primgran," he grunted.

"I'll be interested in looking up your personnel file, when I get home," she mused. "I want to see how you doctored your genetic chart to conceal yourself. And how you managed to keep tabs on Marvis and me, without us ever dreaming you existed! Very cleverly, I'm sure. You had to be bright indeed to anticipate by several hours that she and I might come to Arbora, so you could be on hand to welcome us separately. Well, so long, Holm. Fess up to Marvis, and have plenty of kids."

"You'll be back, Gweanny," he told her.

"Don't count on it."

"It pleases you now to be unreasonable, but in the long run you won't be unrealistic." He chuckled. "And the reality is that I'm the only available male."

"Don't count on that, either. You concealed yourself. Maybe another is somewhere around, doing the same. Not likely, maybe, but even so I'd prefer to spend my whole life waiting for him rather than be your second-stringer."

"I don't understand you," he complained.

"My unreasonableness. If you understood that, you would have anticipated my unreasonable decision to decoy Marvis away from Arbora when I left. If I hadn't tried that, I wouldn't have gotten wise to you."

"Well," he said confidently, "jealousy on your part was hardly expected. And, of course, feeling that way, you'll surely return."

"Meaning I love you?" she sneered. "Hah! If I did, do you think I'd fret over competition from Marvis? I'd just blow a hole through her! I was trying to prevent a competition I didn't care about enough to win! Love you? Hell, Holm, I don't even *like* you!"

With that she warped for home. She had meant what she said, but, golly, how she was going to need a male when she reached Marvis's age!

Hours later, and far from Arbora, a voice piped in her left ear: "Nice going, Gweanvin Oster."

"Huh? Who's that?"

No response.

Who could it have been? It had sounded like the voice of a boy, perhaps twelve years old. But what would a kid be doing way out here, and how could he have known of her?

She guessed the answers, of course, long before she knew them for sure nearly a decade later. By then the boyish voice had deepened and matured.

Gweanvin never returned to Arbora. Her children did. ★

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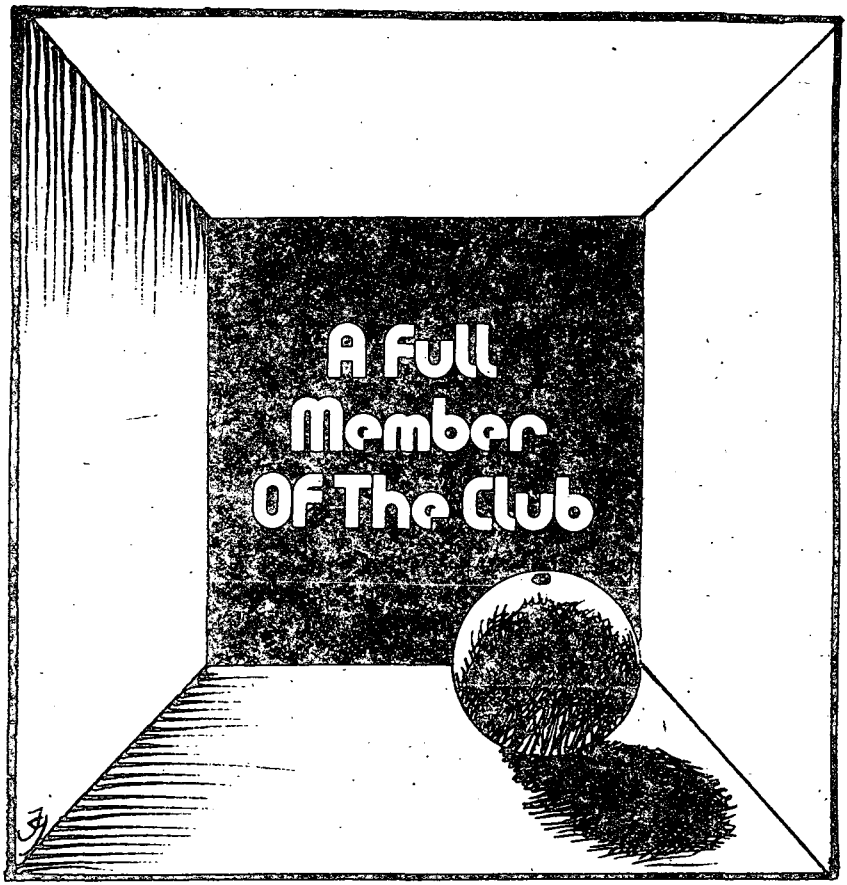

A woman is a woman,
but a Perfect cigar . . .

BOB SHAW

It was a trivial thing—a cigarette lighter—which finally wrecked Philip Connor's peace of mind.

Angela and he had been sitting at the edge of her pool for more than an hour. She had said very little during that time, but every word, every impatient gesture of her slim hands, had conveyed the message that it was all over between them.

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Connor was sitting upright on a canvas chair, manifestly ill at ease, trying to understand what had brought about the change in their relationship. He studied Angela carefully, but her face was rendered inscrutable, inhuman, by the huge insect eyes of her sunglasses. His gaze strayed to a lone white butterfly as it made a hazardous flight across the pool and passed, twinkling like a star, into the shade of the birches.

He touched his forehead and found it buttery with sweat. "This heat is murderous."

"It suits me," Angela said, another reminder that they were no longer as one. She moved slightly on the lounger, altering the brown curvatures of her semi-nakedness.

Connor stared nostalgically at the miniature landscape of flesh, the territory from which he was being evicted, and reviewed the situation. The death of an uncle had made Angela rich, *very* rich, but he was unable to accept that as sufficient reason for her change in attitude. His own business interests brought him more than two-hundred thousand a year, so she knew he wasn't a fortune hunter.

"I have an appointment in a little while," Angela said with a patently insincere little smile.

Connor decided to try making her feel guilty. "You want me to leave?"

He was rewarded by a look of concern, but it was quickly gone, leaving the beautiful face as calm and immobile as before.

Angela sat up, took a cigarette from a pack on the low table, opened her purse and brought out the gold cigarette lighter. It slipped from her fingers, whirred across the tiles and went into the shallow end of the pool. With a little cry of concern she reached down into the water and retrieved the lighter, wetting her face and tawny hair in the process. She clicked the dripping lighter once and it lit. Angela gave Connor a strangely wary glance, dropped the lighter back into her purse and stood up.

"I'm sorry, Phil," she said. "I have to go now."

It was an abrupt dismissal but Connor, emotionally bruised as he was, scarcely noticed. He was a gypsy entrepreneur, a wheeler-dealer, one of the very best—and his professional instincts were aroused. The lighter had ignited first time while soaking wet, which meant it was the best he had ever seen, and yet its superb styling was unfamiliar to him. This fact bothered Connor. It was his business to know all there was to know about the world's supply of sleek, shiny, expensive goodies, and obviously he had let something important slip through his net.

"All right, Angie." He got to his feet. "That's a nice lighter—mind if I have a look?"

She clutched her purse as though he had moved to snatch it. "Why

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don't you leave me alone? Go away, Phil." She turned and strode off toward the house.

"I'll stop by for a while tomorrow."

"Do that," she called without looking back. "I won't be here."

Connor walked back to his Lincoln, lowered himself gingerly onto the baking upholstery and drove into Long Beach. It was late in the afternoon but he went back to his office and began telephoning various trade contacts, making sure they too were unaware of something new and radical in cigarette lighters. Both his secretary and telephonist were on vacation so he did all the work himself. The activity helped to ease the throbbing hurt of having lost Angela, and—in a way he was unable to explain—gave him a comforting sense that he was doing something toward getting her back or at least finding out what had gone wrong between them.

He had an illogical conviction that the little gold artifact was somehow connected with their breaking up. The idea was utterly ridiculous, of course, but in thinking back over the interlude by the pool with Angela it struck him that, amazingly for her, she had gone without smoking. Although it probably meant she was cutting down, another possibility was that she had not wanted to produce the lighter in his presence.

Realizing his inquiries were getting him nowhere, he closed up the office and drove across town to his apartment. The evening was well advanced yet seemingly hotter than ever—the sun had descended to a vantage point from which it could attack more efficiently, slanting its rays through the car windows. He let himself into his apartment, showered, changed his clothes and prowled unhappily through the spacious rooms wishing Angela was with him. A lack of appetite robbed him of even the solace of food. At midnight he brewed coffee with his most expensive Kenyan blend, deriving a spare satisfaction from the aroma, but took only a few disappointed sips. *If only,* he thought for the thousandth time, *they could make it taste the way it smells.*

He went to bed, consciously lonely, yearned for Angela until he fell asleep.

NEXT morning Connor awoke feeling hungry and, while eating a substantial breakfast, was relieved to find he had regained his usual buoyant outlook on life. It was perfectly natural for Angela to be affected by the sudden change in her circumstances, but when the novelty of being rich, instead of merely well off, had faded he would win her back. And in the meanwhile he—the man who had been first in the country with Japanese liquid display watches—was not going to give up on a simple thing

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like a new type of cigarette lighter.

Deciding against going to his office, he got on the phone and set up further chains of business inquiries, spreading his net as far as Europe and the Far East. By midmorning the urge to see Angela again had become very strong. He ordered his car to be brought round to the main entrance of the building and he drove south on the coast road to Asbury Park. It looked like being another day of unrelieved sunshine, but a fresh breeze from the Atlantic was fluttering in the car windows and further elevating his spirits.

When he got to Angela's house there was an unfamiliar car in the U-shaped driveway. A middle-aged man wearing a tan suit and steel-rimmed glasses was on the steps, ostentatiously locking the front door. Connor parked close to the steps and got out.

The stranger turned to face him, jingling a set of keys. "Can I help you?"

"I don't think so," Connor said, resenting the unexpected presence. "I called to see Miss Lomond."

"Was it a business matter? I'm Millett of Millett and Fiesler."

"No—I'm a friend." Connor moved impatiently toward the doorbell.

"Then you should know Miss Lomond doesn't live here any more. The house is going up for sale."

Connor froze, remembering Angela had said she wouldn't be around, and shocked that she had not told him about selling out. "She did tell me, but I hadn't realized she was leaving so soon," he improvised. "When's her furniture being collected?"

"It isn't. The property is being sold fully furnished."

"She's taking *nothing?*"

"Not a stick. I guess Miss Lomond can afford new furniture without too much difficulty," Millett said drily, walking toward his car. "Good morning."

"Wait a minute." Connor ran down the steps. "Where can I get in touch with Angela?"

Millett ran a speculative eye over Connor's car and clothing before he answered. "Miss Lomond has bought Avalon—but I don't know if she has moved in yet."

"Avalon? You mean . . .?" Lost for words, Connor pointed south in the direction of Point Pleasant.

"That's right." Millett nodded and drove away. Connor got into his own car, lit his pipe and tried to enjoy a smoke while he absorbed the impact of what he had heard. Angela and he had never discussed finance—she simply had no interest in the subject—and it was only through oblique references that he had guesstimated the size of her inheritance as in the region of a million, perhaps two. But Avalon was a rich man's folly in the old Randolph Hearst tradition. Surrounded by a dozen square miles of the choicest land in Philadelphia, it

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was the nearest thing to a royal palace that existed outside Europe.

Real estate was not one of Connor's specialties, but he knew that anybody buying Avalon would have had to open the bidding at ten million or more. In other words, Angela was not merely rich—she had graduated into the millionaires' superleague, and it was hardly surprising that her emotional life had been affected.

Connor was puzzled, nevertheless, over the fact that she was selling all her furniture. There was, among several cherished pieces, a Gaudreau writing desk for which she had always shown an exaggerated possessiveness. Suddenly aware that he could neither taste nor smell the imported tobacco which had seemed so good in his pouch, Connor extinguished his pipe and drove out onto the highway.

He had traveled south for some five miles before admitting to himself that he was going to Avalon.

The house itself was invisible, screened from the road by a high redbrick wall. Age had mellowed the brickwork, but the coping stones on top had a fresh appearance and were surmounted by a climb-proof wire fence. Connor drove along beside the wall until it curved inwards to a set of massive gates which were closed. At the sound of his horn a thickset man with a gun on his hip, wearing a uniform of *cafe-au-lait* gabardine, emerged from a lodge. He looked out through the gate without speaking.

Connor lowered a car window and put his head out. "Is Miss Lomond at home?"

"What's your name?" the guard said.

"I'm Philip Connor."

"Your name isn't on my list."

"Look, I only asked if Miss Lomond was at home."

"I don't give out information."

"But I'm a personal friend. You're obliged to tell me whether she's at home or not."

"Is that a fact?" The guard turned and sauntered back into the lodge, ignoring Connor's shouts and repeated blasts on the horn. Angered by the incident, Connor decided not to slink away. He began sounding the car horn in a steady bludgeoning rhythm—five seconds on, five seconds off. The guard did not reappear. Five minutes later a police cruiser pulled alongside with two state troopers in it and Connor was moved on with an injunction to calm down.

For lack of anything better to do he went to his office.

A WEEK went by, during which time Connor drew a complete blank on the cigarette lighter and was almost forced to the conclusion that it had been custom-built by a modern Faberge. He spent hours trying to get a telephone number for Angela, without success. Sleep

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began to elude him, and he felt himself nearing the boundary separating rationality from obsession. Finally, he saw a society column picture of Angela in a New York nightspot with Bobby Janke, playboy son of an oil billionaire. Apart from making Connor feel ill with jealousy the newspaper item provided him with the information that Angela was taking up residence at her newly acquired home sometime the following weekend.

Who cares? he demanded of his shaving mirror. *Who cares?*

He began drinking vodka tonics at lunchtime on Saturday, veered onto white rum during the afternoon, and by nightfall was suffused with a kind of alcoholic dharma which told him that he was entitled to see Angela and to employ any means necessary to achieve that end. There was the problem of the high brick wall but, with a flash of enlightenment, Connor realized that walls are mainly psychological barriers. To a person who understood their nature as well as he did, walls became doorways. Taking a mouthful of neat rum to strengthen his sense of purpose, Connor sent for his car.

Avalon's main entrance, scene of earlier defeat, was in darkness when he reached it, but lights were showing in the gate lodge. Connor drove on by, following the line of the wall, parked on a deserted stretch of second-class road. He switched off all lights, opened the trunk, took out a heavy hammer and chisel, crossed the verge and—without any preliminaries—attacked the wall. Ten minutes later, although the mortar was soft with age, he had not succeeded in removing one brick and was beginning to experience doubts. Then a brick came free and another virtually tumbled out after it. He enlarged the hole to an appropriate size and crawled through onto dry turf.

A dwarfish half-moon was perched near zenith, casting a wan radiance on the turrets and gables of a mansion which sat on the crest of a gentle rise. The building was dark and forbidding, and as he looked at it Connor felt the warm glow in his stomach fade away. He hesitated, swore at himself and set off up the slope, leaving his hammer and chisel behind. By bearing to the left he brought the front elevation of the building into view and was encouraged to see one illuminated window on the first floor. He reached a paved approach road, followed it to the Gothic-style front entrance and rang for admission. A full minute later the door was opened by an archetypal and startled-looking butler, and Connor sensed immediately that Angela was not at home.

He cleared his throat. "Miss Lomond . . ."

"Miss Lomond is not expected until mid . . ."

"Midnight," Connor put in, ex-

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pertly taking his cue. "I know that—I was with her this afternoon in New York. We arranged that I would stop by for a late drink."

"I'm sorry, sir, but Miss Lomond didn't tell me to expect visitors."

Connor looked surprised. "She didn't? Well, the main thing is she remembered to let them know at the gate lodge." He squeezed the butler's arm democratically. "You know, you couldn't get through that gate in a Sherman tank if your name wasn't on the list."

The butler looked relieved. "One can't be too careful these days, sir."

"Quite right. I'm Mr. Connor, by the way—here's my card. Now show me where I can wait for Miss Lomond. And, if it isn't imposing too much, I'd like a Daiquiri. Just one to toy with while I'm waiting."

"Of course, Mr. Connor."

Exhilarated by his success, Connor was installed in an enormous green-and-silver room and supplied with a frosty glass. He sat in a very comfortable armchair and sipped his Daiquiri. It was the best he had ever tasted.

The sense of relaxation prompted him to reach for his pipe but he discovered it must have been left at home. He prowled around the room, found a box of cigars on a sideboard and took one from it. He then glanced around for a lighter. His gaze fell on a transparent ruby-colored ovoid sitting upright on an occasional table. In no way did it resemble any table lighter he had ever seen, but he had become morbidly sensitive on the subject, and the ovoid was positioned where he would have expected a lighter to be.

Connor picked it up, held it to the light and found it was perfectly clear, without visible works. That meant it could not be a lighter. As he was setting it down, he allowed his thumb to slide into a seductively shaped depression on the side.

A pea-sized ball of radiance—like a bead fashioned from sunlight—appeared at the top of the egg. It shone with absolute steadiness until he removed his thumb from the dimple.

Fascinated by his find, he made the tiny globe of brilliance appear and disappear over and over again, proved its hotness with a fingertip. He took out the pocket magnifier he always carried for evaluating trinkets and examined the tip of the egg. The glass revealed a minute silver plug set flush with the surface, but nothing more. Following a hunch, Connor carefully guided one drop of liquid from his drink onto the egg and made sure it was covering the nearly invisible plug. When he operated the lighter it worked perfectly, the golden bead burning without wavering until the liquid had boiled off into the air.

He set the lighter down and noticed yet another strange property—the ruby egg was smoothly rounded at the bottom yet it sat upright, with no tendency to topple

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over. His magnifier showed an ornate letter P engraved in the base, but provided no clue as to how the balancing act was achieved.

Connor gulped the remainder of his drink and, with eyes suddenly sober and watchful took a fresh look around the room. He discovered a beautiful clock, apparently carved from solid onyx. As he had half-expected there was no way to open it and the same elaborate P was engraved on the underside.

There was also a television set which had a superficial resemblance to an expensive commercial model but which bore no maker's name plaque. He checked it over and found the now-familiar P inscribed on one side where it would never be noticed except by a person making a purposeful search. When he switched the set on the image of a newscaster which appeared was so perfect that he might have been looking through a plate glass window into the man's face. Connor studied the picture from a distance of only a few inches and could not resolve it into lines or dots. His magnifier achieved no better results.

He switched the television off and returned to the armchair, filled with a strange and powerful emotion. Although it was in his nature to be sharp and acquisitive—those were attributes without which he could never have entered his chosen profession—it had always remained uppermost in his mind that the world's supply of money was unlimited, whereas his own allocation of years was hopelessly inadequate. He could have trebled his income by working longer and pushing harder, but had always chosen another course simply because his desire for possessions had never taken control.

That, however, had been before he discovered the sort of possessions real money could buy. He knew he was particularly susceptible to gadgets and toys, but the knowledge did nothing to lessen the harsh raw hunger he now felt.

There was no way that anybody was going to stop him from joining the ranks of those who could afford future-technology artifacts. He would prefer to do it by marrying Angela, because he loved her and would enjoy sharing the experiences, but if she refused to have him back he would do it by making the necessary millions himself.

A phrase which had been part of his train of thought isolated itself in his mind. *Future technology.* He weighed the implications for a moment then shrugged them off—he had lost enough mental equilibrium without entertaining fantasies about time travel.

The idea, though, was an intriguing one. And it answered certain questions. The lighters he coveted, partly for their perfection and partly because they could earn him a fortune, were technically far in advance of anything on the

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world's markets, yet it was within the realms of possibility that a furtive genius was producing them in a back room somewhere. But that impossibly good television set could not have been manufactured without the R&D facilities of a powerful electronics concern. The notion that they were being made in the future and shipped back in time was only slightly less ridiculous than the idea of a secret industry catering exclusively for the superrich . . .

CONNOR picked up the cigar and lit it, childishly pleased at having a reason to put the ruby egg to work. His first draw on the cool smoke gave him the feeling that he had been searching for something all his life and suddenly had found it. Cautiously at first and then with intense pleasure he filled his lungs with the unexpected fragrance.

He luxuriated. This was smoking as portrayed by tobacco company commercials—not the shallow disappointing experience commonly known to smokers everywhere. He had often wondered why the leaf which smelled so beguiling before it was lit, or when someone nearby was smoking, promising sensual delights and heart's ease, never yielded anything more than virtually tasteless smoke.

They promise you 'a long cool smoke to soothe a troubled world', Connor thought, *and this is it.* He took the cigar from his mouth and examined the band. It was of unembellished gold and bore a single ornate P.

"I might have known," he announced to the empty room. He looked around through a filigree of smoke, wondering if everything in the room was different from the norm, superior, better than the best. Perhaps the ultra-rich scorned to use *anything* that was available to the man-in-the-street or advertised on television or . . .

"Philip!" Angela stood in the doorway, pale of face, shocked and angry. "What are you doing here?"

"Enjoying the best cigar I've ever had." Connor got to his feet, smiling. "I presume you keep them for the benefit of guests—I mean, a cigar is hardly your style."

"Where's Gilbert?" she snapped. "You're leaving right now."

"Not a chance."

"That's what you think." Angela turned with an angry flail of blonde hair and cerise skirts.

Connor realized he had to find inspiration and get in fast. "It's too late, Angela. I've smoked your cigar, I lit it with your lighter, I have checked the time with your clock, and I've watched your television."

He had been hoping for a noticeable reaction and was not disappointed—Angela burst into tears. "You bastard! You had no *right!*"

She ran to the table, picked up the lighter and tried to make it work. Nothing happened. She went

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to the clock, which had stopped; and to the television set, which remained lifeless when she switched it on. Connor followed her circuit of the room, feeling guilty and baffled. Angela dropped into a chair and sat with her face in her hands, huddled and trembling like a sick bird. The sight of her distress produced a painful churning in his chest. He knelt in front of Angela.

"Listen, Angie," he said. "Don't cry like that. I only wanted to see you again—I haven't done anything."

"You touched my stuff and made it change. They told me it would change if anybody but a client used it . . . and it has."

"This doesn't make sense. Who said what would change?"

"The suppliers." She looked at him with tear-brimmed eyes and all at once he became aware of a perfume so exquisite that he wanted to fall toward its source like a suffocating man striving toward air.

"What did you . . .? I don't . . ."

"They said it would all be spoiled."

Connor tried to fight off the effects of the witch-magic he had breathed. "Nothing has been spoiled, Angie. There's been a power failure . . . or something . . ." His words trailed away uncertainly. The clock and the television set were cordless. He took a nervous drag on the half-smoked cigar and almost gagged on the flat acrid taste of it. The sharp sense of loss he experienced while stubbing it out seemed to obliterate all traces of his scepticism.

He returned to Angela's chair and knelt again. "They said this stuff would stop working if anybody but you touched it?"

"Yes."

"But how could that be arranged?"

She dabbed her eyes with a handkerchief. "How would I know? When Mr. Smith came over from Trenton he said something about all his goods having an . . . essence field, and he said I had a molecular thumbprint. Does that make sense?"

"It almost does," Connor whispered. "A perfect security system. Even if you lost your lighter at the theatre, when somebody else picked it up it would cease to be what it was."

"Or when somebody breaks into your home."

"Believe me, it was only because I had to see you again, Angie. You know that I love you."

"Do you, Philip?"

"Yes, darling." He was thrilled to hear the special softness return to her voice. "Look, you have to let me pay for a new lighter and television and . . ."

Angela was shaking her head. "You couldn't do it, Philip."

"Why not?" He took her hand and was further encouraged when she allowed it to remain in his.

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She gave him a tremulous smile. "You just couldn't. The installments are too high."

"Installments? For God's sake, Angie, *you* don't buy stuff on time."

"You can't buy these things—you pay for a service. I pay in installments of eight hundred and sixty-four thousand dollars."

"A year?"

"Once every forty-three days. I shouldn't be telling you all this, but . . ."

Connor gave an incredulous laugh. "That comes to about six million a year—nobody would pay that much!"

"Some people would. If you even have to think about the cost Mr. Smith doesn't do business with you."

"But . . ." Connor incautiously leaned within range of Angela's perfume and it took his mind. "You realize," he said in a weak voice, "that all your new toys come from the future? There's something fantastically wrong about the whole set-up."

"I've missed you, Philip."

"That perfume you're wearing—did it come from Mr. Smith, too?"

"I tried not to miss you, but I did." Angela pressed her face against his and he felt the coolness of tears on her cheek. He kissed her hungrily as she moved down from the chair to kneel against him. Connor spun towards the center of a whirlpool of ecstasy.

"Life's going to be so good when we're married," he heard himself saying after a time. "Better than we could ever have dreamed. There's no much for us to share and . . ."

Angela's body stiffened and she thrust herself away from him. "You'd better go now, Philip."

"What is it? What did I say?"

"You gave yourself away, that's all."

Connor thought back. "Was it what I said about sharing? I didn't mean your money—I was talking about life . . . the years . . . the experiences."

"Did you?"

"I loved you before you even knew you would inherit a cent."

"You never mentioned marriage before."

"I thought that was understood," he said desperately. "I thought you . . ." He stopped speaking as he saw the look in Angela's eyes. Cool, suspicious, disdainful. The look that the very rich had always given to outsiders who tried to get into their club without the vital qualification of wealth.

She touched a bellpush and continued standing with her back to him until he was shown out of the room.

THE ensuing days were bad ones for Connor. He drank a lot, realized that alcohol was no answer, and went on drinking. For a while he tried getting in touch with

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Angela and once even drove down to Avalon. The brickwork had been repaired at the point where he had made his entry, and a close inspection revealed that the entire wall was now covered with a fine mesh. He had no doubt that tampering with it in any way would trigger off an alarm system.

When he awoke during the night he was kept awake by hammering questions. What was it all about? Why did Angela have to make such odd payments, and at such odd intervals? What would men from the future want with Twentieth Century currency?

On several occasions the thought occurred that, instead of concentrating on Angela, he would do better to find the mysterious Mr. Smith of Trenton. The flicker of optimism the idea produced was quenched almost immediately by the realization that he simply did not have enough information to provide a lead. It was a certainty that the man was not even known as Smith to anybody but his clients. If only Angela had revealed something more—like Smith's business address . . .

Connor returned each time to brooding and drinking, aware but uncaring that his behavior was becoming completely obsessive. Then he awoke one morning to the discovery that he already knew Smith's business address, had known it for a long time, almost from childhood.

Undecided as to whether his intake of white rum had hastened or delayed the revelation, he breakfasted on strong coffee and was too busy with his thoughts to fret about the black liquid being more tasteless than ever. He formulated a plan of action during the next hour, twice lighting his pipe—out of sheer habit—before remembering he was finished with ordinary tobacco forever. As a first step in the plan he went out, bought a five-inch cube of ruby-colored plastic and paid the owner of a jobbing shop an exorbitant sum to have the block machined down to a polished ovoid. It was late in the afternoon before the work was finished, but the end product sufficiently resembled a P-brand table lighter to fool anyone who was not looking too closely at it.

Pleased with his progress thus far, Connor went back to his apartment and dug out the .38 pistol he had bought a few years earlier following an attempted burglary. Common sense told him it was rather late to leave for Trenton and that he would be better waiting until morning, but he was in a warmly reckless mood. With the plastic egg bumping on one hip and the gun on the other, he drove westward out of town.

CONNOR reached the center of Trenton just as the stores were showing signs of closing for the

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day. His sudden fear of being too late and of having to wait another day after all was strengthened by the discovery that he was no longer so certain about locating Mr. Smith.

In the freshness of the morning, with an alcoholic incense lingering in his head, it had all seemed simple and straightforward. For much of his life he had been peripherally aware that in almost every big city there are stores which have no right to be in existence. They were always small and discreet, positioned some way off the main shopping thoroughfares, and their signs usually bore legends—like "Johnston Bros" or "H&L"—which seemed designed to convey a minimum of information. If they had a window display at all it tended to be nothing more than an undistinguished and slightly out-of-style sport jacket priced three times above what it had any chance of fetching. Connor knew the stores were not viable propositions in the ordinary way because, not surprisingly, nobody ever went into them. Yet in his mind they were in some indefinable way associated with money.

Setting out for Trenton he had been quite sure of the city block he wanted—now at least three locations and images of three unremarkable store fronts were merging and blurring in his memory. *That's how they avoid attention,* he thought, refusing to be disheartened, and began cruising the general area he had selected. The rush of home-going traffic hampered every movement and finally he decided he would do better on foot. He parked in a sidestreet and began hurrying from corner to corner, each time convincing himself he was about to look along a remembered block and see the place he so desperately wanted to find, each time being disappointed. Virtually all the stores were closed by now, the crowds had thinned away, and the reddish evening sunlight made the quiet dusty facades look unreal. Connor ran out of steam, physical and mental.

He swore dejectedly, shrugged and started limping back to his car, choosing—as a token act of defiance—a route which took him a block further south than he had originally intended going. His feet were hot and so painful that he was unable to think of anything but his own discomfort. Consequently he did a genuine double-take when he reached an intersection, glanced sideways and saw a half-familiar half-forgotten vista of commonplace stores, wholesalers' depots and anonymous doorways. His heart began a slow pounding as he picked out, midway on the block, a plain store front whose complete lack of character would have rendered it invisible to eyes other than his own.

He walked towards it, suddenly nervous, until he could read the

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sign which said GENERAL AGENCIES in tarnished gold lettering. The window contained three pieces of glazed earthenware sewer pipe, beyond which were screens to prevent anyone seeing the store's interior. Connor expected to find the door locked, but it opened at his touch and he was inside without even having had time to prepare himself. He blinked at a tall gaunt man who was standing motionless behind a counter. The man had a down-curving mouth, ice-smooth gray hair, and something about him gave Connor the impression that he had been standing there, unmoving, for hours. He was dressed in funeral director black, with a silver tie, and the collar of his white shirt was perfect as the petals of a newly-opened flower.

The man leaned forward slightly and said, "Was there something, sir?"

Connor was taken aback by the quaintness of the greeting but he strode to the counter, brought the ruby egg from his pocket and banged it down.

"Tell Mr. Smith I'm not satisfied with this thing," he said in an angry voice. "And tell him I demand a repayment."

The tall man's composure seemed to shatter. He picked up the egg, half-turned toward an inner door, then paused and examined the egg more closely.

"Just a minute," he said. "This isn't . . ."

"Isn't what?"

The man looked accusingly at Connor. "I've no idea what this object is, and we haven't got a Mr. Smith."

"Know what *this* object is?" Connor produced his revolver. He had seen and heard enough.

"You wouldn't dare."

"No?" Connor aimed the revolver at the other man's face and aware that the safety catch was on, gave the trigger an obvious squeeze. The tall man shrank against the wall. Connor muttered furiously, clicked the safety off, and raised the gun again.

"Don't!" The man shook his head. "I beseech you."

Connor had never been beseeched his his life but he did not allow the curious turn of speech to distract him. He said, "I want to see Mr. Smith."

"I'll take you to him. If you will follow me . . ."

They went through to the rear of the premises and down a flight of stairs which had inconveniently high risers and narrow treads. Noting that his guide was descending with ease, Connor glanced down and saw that the tall man had abnormally small feet. There was another peculiarity about his gait but it was not until they had reached the basement floor and were moving along a corridor that Connor realized what it was. Within the chalk-stripe trousers, the tall man's knees appeared to be a good two-

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thirds of the way down his legs. Cool fingers of unease touched Connor's brow.

"Here we are, sir." The black-clad figure before him pushed open a door.

BEYOND it was a large brightly-lit room and at one side was another tall cadaverous man dressed like a funeral director. He too had ice-smooth gray hair and he was carefully putting an antique oil painting into the dark rectangular opening of a wall safe.

Without turning his head, he said, "What is it, Toynbee?"

Connor slammed the door shut behind himself. "I want to talk to you, Smith."

Smith gave a violent start, but continued gently sliding the gold-framed painting into the wall. When it had disappeared he turned to face Connor. He had a down-curved mouth and—even more disturbingly—his knees, also, seemed to be in the wrong place. *If these people come from the future,* Connor thought, *why are they made differently from us?* His mind shied away from the new thought and plunged into irrelevant speculations about the kind of chairs Smith and Toynbee must use . . . if any. He realized he had seen no seats or stools about the place. With a growing coldness in his veins, Connor recalled his earlier impression that Toynbee had been standing behind the counter for hours, without moving.

". . . welcome to what money we have," Smith was saying, "but there's nothing else here worth taking."

"I don't think he's a thief." Toynbee went and stood beside him.

"Not a thief! Then what does he want? What is . . .?

"Just for starters," Connor put in, "I want an explanation."

"Of what?"

"Of your entire operation here."

Smith looked mildly exasperated. He gestured at the wooden crates which filled much of the room. "It's a perfectly normal agency set-up handling various industrial products on a . . ."

"I mean the operation whereby you supply rich people with cigarette lighters that nobody on this Earth could manufacture."

"Cigarette lighters—"

"The red egg-shaped ones which have no works but light when they're wet and stand upright without support."

Smith shook his head. "I wish I *could* get into something like that."

"And the television sets which are too good. And the clocks and cigars and all the other things which are so perfect that people who can afford it are willing to pay eight hundred sixty-four thousand dollars every forty-three days for them—even though the goodies are charged with an essence field which

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fades out and converts them to junk if they fall into the hands of anybody who isn't in the club."

"I don't understand a word of this."

"It's no use, Mr. Smith," Toynbee said. "Somebody has talked."

Smith gave him a venomous stare. "*You* just did, you fool!" In his anger Smith moved closer to Toynbee, so that his body was no longer shielding the wall safe. Connor noticed for the first time that it was exceptionally large, and it occurred to him that a basement storeroom was an odd place for that particular type of safe. He looked at it more closely. The darkness of the interior revealed no trace of the oil painting he had just seen loaded into it. And, far into the tunnel-like blackness, a bright green star was throwing off expanding rings of light, rings which faded as they grew.

Connor made a new effort to retain his grasp of the situation. He pointed to the safe and said, casually, "I assume that's a two-way transporter."

Smith was visibly shaken. "All right," he said, after a tense silence, "who talked to you?"

"Nobody." Connor felt he could get Angela into trouble of some kind by mentioning her name.

Toynbee cleared his throat. "I'll bet it was that Miss Lomond. I've always said you can't trust the *nouveau riche*—the proper instincts aren't sufficiently ingrained."

Smith nodded agreement. "You are right. She got a replacement table lighter, television and clock—the things this . . . person has just mentioned. She said they had been detuned by someone who broke into her house."

"She must have told him everything she knew."

"And broken her contract—make a note of that, Mr. Toynbee."

"Hold on a minute," Connor said loudly, brandishing the revolver to remind them he was in control. "Nobody's going to make a note of anything till I get the answers I want. These products you deal in—do they come from the future or—somewhere?"

"From somewhere," Smith told him. "Actually, they come from a short distance in the future as well, but—as far as you are concerned—the important thing is that they are transported over many light years. The time difference is incidental, and quite difficult to prove."

"They're from another planet?"

"Yes."

"You, too?"

"Of course."

"You bring advanced products to Earth in secret and sell or rent them to rich people?"

"Yes. Only smaller stuff comes here, of course—larger items, like the television sets, come in at main receivers in other cities. The details of the operation may be surprising, but surely the general principles of commerce are well known to you."

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"That's exactly what's bothering me," Connor said. "I don't give a damn about other worlds and matter transmitters, but I can't see why you go to all this trouble. Earth currency would be of no value on . . . wherever you come from. You're ahead on technology, so there is nothing . . ." Connor stopped talking as he remembered what Smith had been feeding into the black rectangle. An old oil painting.

Smith nodded, looking more relaxed. "You are right about your currency being useless on another world. We spend it here. Humanity is primitive in many respects, but the race's artistic genius is quite remarkable. Our organization makes a good trading surplus by exporting paintings and sculptures. You see the goods we import are comparatively worthless."

"They seem valuable to me."

"They *would* seem that way to you—that's the whole point. We don't bother bringing in the things that Earth can produce reasonably well. Your wines and other drinks aren't too bad, so we don't touch them. But your coffee!" Smith's mouth curved even further downward.

"That means you're spending millions. Somebody should have noticed one outfit buying up so much stuff."

"Not really. We do quite a bit of direct buying at auctions and galleries, but often our clients buy on our behalf and we credit their accounts."

"Oh, no," Connor breathed as the ramifications of what Smith was saying unfolded new vistas in his mind. Was this why millionaires, even the most unlikely types of men, so often became art collectors? Was this the *raison d'etre* for that curious phenomenon, the private collection? In a society where the rich derived so much pleasure from showing off their possessions, why did so many art treasures disappear from the public view? Was it because their owners were trading them in against P-brand products? If that was the case the organization concerned must be huge and it must have been around for a long time. Connor's legs suddenly felt tired.

He said, "Let's sit down and talk about this."

Smith looked slightly uncomfortable. "We don't sit. Why don't you use one of those crates if you aren't feeling well?"

"There's nothing wrong with me, so don't try anything," Connor said sharply, but he sat on the edge of a box while his brain worked to assimilate shocking new concepts. "What does the P stand for on your products?"

"Can't you guess?"

"Perfect?"

"That is correct."

The readiness with which Smith was now giving information made Connor a little wary, but he pressed

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on with other questions which had been gnawing at him. "Miss Lomond told me her installments were eight hundred and sixty-four thousand dollars—why that particular figure? Why not a million?"

"That *is* a million—in our money. A rough equivalent, of course."

"I see. And the forty-three days."

"One revolution of our primary moon. It's a natural accounting period."

Connor almost began to wish the flow of information would slow down. "I still don't see the need for all this secrecy. Why not come out in the open, reduce your unit prices and multiply the volume? You could make a hundred times as much."

"We have to work underground for a number of reasons. In all probability the various Earth governments would object to the loss of art treasures, and there are certain difficulties at the other end."

"Such as?"

"There's a law against influencing events on worlds which are at a sensitive stage of their development. This limits our supply of trade goods very sharply."

"In other words, you are crooks on your own world and crooks on this one."

"I don't agree. What harm do we do on Earth?"

"You've already named it—you are depriving the people of this planet of . . ."

"Of their artistic heritage?" Smith gave a thin sneer. "How many people do you know who would give up a Perfect television set to keep a da Vinci cartoon in a public art gallery five or ten thousand miles away?"

"You've got a point there," Connor admitted. "What have you got up your sleeve, Smith?"

"I don't understand."

"Don't play innocent. You would not have talked so freely unless you were certain I wouldn't get out of here with the information. What are you planning to do about me?"

Smith glanced at Toynbee and sighed. "I keep forgetting how parochial the natives of a single-planet culture can be. You have been told that we are from another world, and yet to you we are just slightly unusual Earth people. I don't suppose it has occurred to you that other races could have a stronger instinct toward honesty, that deviousness and lies would come less easily to them than to humans?"

"That's where we are most vulnerable," Toynbee put in. "I see now that I was too inexperienced to be up front."

"All right, then—be honest with me," Connor said. "You are planning to keep me quiet, aren't you?"

"As a matter of fact, we do have a little device . . ."

"You don't need it," Connor said. He thought back carefully over all he had been told, then

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stood up and handed his revolver to Smith.

THE good life was all that he had expected it to be, and—as he drove south to Avalon—Connor could feel it getting better by the minute.

His business sense had always been sharp, but whereas he had once reckoned a month's profits in thousands, he now thought in terms of six figures. Introductions, opportunities and deals came thick and fast, and always it was the P-brand artifacts which magically paved the way. During important first contacts he had only to use his gold lighter to ignite a pipeful of P-brand tobacco—the incredible leaf which fulfilled all the promise of its "nose", or glance at his P-brand watch, or write with the pen which produced any color at the touch of a spectrum ring, and all doors were opened wide. The various beautiful trinkets were individually styled, but he quickly learned to recognize them when they were displayed by others, and to make the appropriate responses.

Within a few weeks, although he was scarcely aware of it, his outlook on life had undergone a profound change. At first he was merely uneasy or suspicious when approached by people who failed to show the talismen. Then he became hostile, preferring to associate only with those who could prove they were safe.

Satisfying though his new life was, Connor had decided it would not be perfect until Angela and he were reunited. It was through her that he had achieved awareness and only through her would he achieve completeness. He would have made the journey to Avalon much sooner but for the fact that there had been certain initial difficulties with Smith and Toynbee. Handing over the revolver had been a dangerous gambit which had almost resulted in his being bundled through their matter transmitter to an unknown fate on another world. Luckily, however, it had also convinced them that he had something important to say.

He had talked quickly and well that evening in the basement of the undistinguished little store. Smith, who was the senior of the pair, had been hard to convince; but his interest had quickened as Connor enumerated all the weaknesses in the organization's procurement methods. And it had grown feverish when he heard how Connor's worldly knowhow would eliminate much of the wasteful financial competition of auctions, would streamline the system of purchasing through rich clients, would institute foolproof controls and effective new techniques for diverting art treasures into the organization's hands. It had been the best improvisation of his life, sketchy in places because of his unfamiliarity with the art world, but filled with an inspired

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professionalism which carried his audience along with it.

Early results had been so good that Smith had become possessive, voicing objections to Connor's profitable side dealings. Connor smoothed things over by going on to a seven-day work schedule in which he also worked most evenings. This had made it difficult to find the time to visit Angela, but finally his need to see her had become so great that he had pushed everything else aside and made the time . . .

The guard at the gate lodge was the same man as before, but he gave no sign of remembering his earlier brush with Connor. He waved the car on through with a minimum of delay, and a few minutes later Connor was walking up the broad front steps of the house. The place looked much less awesome to Connor but while ringing for admission he decided that he and Angela would probably keep it, for sentimental reasons as much as anything else. The butler who answered the door was a new man, who looked rather like a retired seaman, and there was a certain lack of smoothness in his manner as he showed Connor to the large room where Angela was waiting. She was standing at the fireplace with her back to the door, just as he had last seen her.

"Angie," he said, "it's good to see you again."

She turned and ran to him. "I've missed you so much, Phil."

As they clung together in the center of the green-and-silver room Connor experienced a moment of exquisite happiness. He buried his face in her hair and began whispering the things he had been unable to say for what seemed a long, long time. Angela answered him feverishly all the while he spoke, responding to the emotion rather than the words.

It was during the first kiss that he became aware of a disturbing fact. She was wearing expensive yet ordinary perfume—not one of the P-brand distillations of magic to which he had become accustomed on the golden creatures he had dated casually during the past few weeks. Still holding Angela close to him he glanced around the big room. A leaden coldness began to spread through his body. Everything in the room was, like her perfume, excellent—but not Perfect.

"Angela," he said quietly, "why did you ask me to come here?"

"What kind of a question is that, darling?"

"It's a perfectly normal question." Connor disengaged from her and stepped back suspiciously. "I merely asked what your motives were."

"*Motives!*" Angela stared at him, color fleeing from her cheeks, then her gaze darted to his wristwatch. "My God, Philip, you're *in!* You made it, just like you said you would."

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"I don't know what you mean."

"Don't try that with me—remember I was the one who told it all to you."

"You should have learned not to talk by this time."

"I know I should, but I didn't." Angela advanced on him. "I'm out now. I'm on the outside."

"It isn't all that bad, is it? Where's Bobby Janke and the rest of his crowd?"

"None of them come near me now. And you know why."

"At least you're not broke." Small solace.

She shook her head. "I've got plenty of money, but what good is it when I can't buy the things I want? I'm shut out, and it's all because I couldn't keep myself from blabbing to you, and because I didn't report the way you were getting on to them. But you didn't mind informing on me, did you?"

Connor opened his mouth to protest his innocence, then realized it would make no difference. "It's been nice seeing you again, Angela," he said. "I'm sorry I can't stay longer but things are stacking up on me back at the office. You know how it is."

"I know exactly how it is. Go on, Philip—get out of here."

Connor crossed to the door, but hesitated as Angela made a faint sound.

She said, "Stay with me, Phil. Please stay."

He stood with his back to her, experiencing a pain which slowly faded, then he walked out.

LATE that afternoon Connor was sitting in his new office when his secretary put through a call. It was Smith, anxious to discuss the acquisition of a collection of antique silver.

"I called you earlier but your girl told me you were out," he said, with a hint of reproach.

"It's true," Connor assured him. "I was out of town—Angela Lomond asked me down to her place."

"Oh?"

"You didn't tell me she was no longer a client."

"You should have known without being told." Smith was silent for a few seconds. "Is she going to try making trouble?"

"No."

"What did she want?"

Connor leaned back in his chair and gazed out through the window, toward the Atlantic. "Who knows? I didn't stay long enough to find out."

"Very wise," Smith said complacently.

When the call had ended, Connor brewed some P-brand coffee, using the supply he kept locked in the drinks cabinet. The Perfection of it soothed from his mind the last lingering traces of remorse.

How on Earth, he wondered idly, *do they manage to make it taste exactly the way it smells?* ★

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FORUM

IS THERE HOPE FOR THE FUTURE?

ISAAC ASIMOV

AT ANY time and under any conditions it is possible to consider the future either pessimistically or optimistically.

It is, after all, never possible to predict the future sharply; one can only make an estimate, and that estimate will cover a range of possibilities. The farther into the future we look, the broader the range. And if we look far enough the range becomes so broad that our predictions have no constraint worth mentioning other than the laws of nature. The range will also be broader as we deal with more and more poorly understood phenomena (with human psychology, for instance, rather than with atomic physics) until it becomes too broad to make prediction useful.

If, however, we restrict ourselves to the moderately close future and to moderately well-understood phenomena, we end up with a range of possibilities that is not prohibitively broad. We are then at liberty to suppose ourselves anywhere within the range, and it is possible to end up with a pessimistic prediction if we choose to use one extreme of the range and with an optimistic one if we choose to use the other.

IT IS, for instance, particularly easy to be pessimistic about the future right now. We need merely assume that population will continue going up, that national rivalries will continue to place the well-being of Group X ahead of the welfare of the world, that racist and sexist prejudice will continue to generate hatred and alienation, that personal and economic greed will continue to ruin the Earth for short-term private profit. In short we need merely assume that things will go on exactly as they have been for another thirty years and we can

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confidently predict the end of our technological civilization.

I suspect that the chances are better than 50 percent that this will happen—how much better I am not certain.

But things don't have to go on as they are. Things *do* change, and surprisingly rapidly, too.

Place yourself in 1954, for instance. It is the height of the complacent Eisenhower era; the depths of the Dulles cold-war. The United States was then as its most self-confident and sanctimonious point in history.

Would you have then imagined that—over the next two decades—contraception would become socially acceptable, a birth control pill would lead to sexual revolution, abortion would become legal in many places, 'cold war' would become a dirty word—and that the very man who had, in earlier years, specialized in flag, mom, and applepie rhetoric would, as President, lead the way to closer friendship with the Soviet Union and with what he *now* calls the People's Republic of China?!

I tell you that in 1954 it was a lot easier to predict—and to have it believed—that men would stand on the Moon in fifteen years than that any of the situations listed in the previous paragraph would come to pass.

Why did all those things come true? No mystery at all. The steady increase in population and the steady decline in resources has faced mankind with a choice of 1) destruction, or 2) population control and world government.

The changes that have taken place in the last twenty years have been in the direction of population control and world government and were more or less inevitable if one had been willing to look the future in the face.

The changes so far have been comparatively small and tentative and are far from sufficient to prevent disaster. I think it is safe to suppose, however, that mankind will continue to move in the direction of population control and world government as, each year, the scope of disaster—and the speed with which it approaches—impresses mankind with a greater and greater horror.

The question is not whether or not mankind will move in this direction—it will!—but whether it will move in this direction rapidly enough. Again, my own feeling is that the probability of rapid-enough motion is less than 50 percent; how much less, I am not certain.

But the motion *may* be fast enough to avert the final catastrophe. In this respect the energy crisis of the winter of 1973-74 performed a great service. The crisis was, to a great extent, made inevitable by the folly of American foreign policy since World War II (see my article "The Double-Ended Candle" in

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the June 1974 issue of *The Magazine of Fantasy and Science Fiction*) [*see also, Dr. A.'s great new post-Catastrophe novelette in the June issue of* Worlds of If! *ed.*] and was exacerbated by the greed of oil companies, but underlying everything is the fact that there is only a limited amount of oil in Earth's oil wells and that that limited amount is vanishing with frightening rapidity.

Nothing has done as much as the energy crisis to convince Americans that the economic interdependence of the world is real and that it includes the United States. Nothing has done as much to convince Americans that our standard of living, so much higher than that of the rest of the world, is at the mercy of the rest of the world. In short, nothing has done as much to convince Americans of the *vulnerability* of the United States. That goes a long way toward making world government seem less of a dirty phrase, since it is now obvious that we may have as much to gain from a globally-organized economy as to give to it.

To be sure, at the time I write, the Arab nations have lifted their boycott and Americans are doing their best to convince themselves that, after a three-month nightmare, everything is exactly as it once was—but that's a self-delusion that cannot be maintained. Oil prices have gone up, inflation has moved along faster, and the oil in the ground is still disappearing. The crisis, believe me, is still with us and won't go away, and a certain amount of American innocence will never return.

LET US imagine, then, that the Earth continues to move in the direction of population control and world government and does so quickly enough to avert a major catastrophe, suffering at most only a mild catastrophe. (After a recent talk I gave at the University of Pittsburgh, I was asked what I meant by "a mild catastrophe", and I replied, "One from which civilization can recover.")

This supposition of fast-enough movement may be low-probability but perhaps it is not zero-probability. Perhaps, under the lash of the gathering horror, we will be forced, kicking and screaming, into survival.

In that case, here would be the situation as Earth enters the 21st Century:

1) World population will stand at 7,000,000,000, but all over the world, heroic and successful measures will be holding the line, and every effort will be made to lower the birth rate to the point where the population will decline toward an ultimate goal of perhaps no more than 1,000,000,000.

2) There will be dreadful shortages of food and raw materials generally, but heroic and successful measures toward the proper distri-

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bution of what exists and toward efficient methods of re-cycling will minimize the more disastrous effects of the shortages.

3) There will still be political units of the type with which we are familiar, but few decisions of any importance will be reached except at international conferences. It will furthermore be clear that no nation can afford to take unilateral action against the will of the others.

IF ALL this is so, we can work out as inevitable corollaries (or inevitable, at least, as long as mankind chooses not to choose destruction) a number of utopian consequences. For instance—

1. The end of sexism.

Womankind's subjection has been the natural consequence of her role as baby machine. In a world of high infant mortality and low life expectancy, the need was for many babies. It takes many babies to have even a few survive, and in agricultural economies many children mean many hands to help with the work. Children are also needed to help support aged parents in a society that would otherwise let them die. (That is the significance of the Biblical "Honor thy mother and thy father." It doesn't refer to standing up when they come into the room. It means *supporting* them.)

In the 21st Century, with a very low birthrate, with childlessness common, and with those children which are born very much more the responsibility of society in general than they are now, women's role as baby machine will have largely disappeared.

In that case, what else will women have to do? Do you suppose they can still be relegated to social and economic inferiority; made to accept the situation that household tasks are peculiarly for the female sex; that passivity is the female role in sex—in business—in government; that the highest function of woman is to support her man in a self-effacing manner and that she must place her physiological wares (but *never* her intellectual wares) constantly on view to catch him in the first place and reflect favorably on him in the second?

If this were indeed to be the situation, women would be condemned to lives so empty that childbearing and child-rearing would be all that could fill them. There would then be an enormous tendency to strive for children under any conditions.

To keep the birthrate successfully low women must be beguiled into other activities; what method would be so natural and so effective as to declare them people—and to allow them to enter *all* facets of human endeavor on an equal basis with men?

2. The end of racism.

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Racism has existed as long as mankind, because any slight difference marks one as outside-the-tribe and therefore as someone to be mocked—if mockery is safe—or feared, if it is not safe to mock. Introduce a new child into a group of children and have him wear clothes a trifle different in style, or speak in a slightly different accent, and watch him become marked for scapegoating at once.

It does not matter that the clothes may differ in being cleaner, or the accent in being more precise, the result is the same. The key word is not 'better', nor is it 'worse'; it is merely 'different.' And, of course, in the thought-processes of the bigot, 'different', whatever its nature, *becomes* 'worse.'

That is why I am not impressed by the attempts of men like Shockley to argue that Blacks are less intelligent than Whites; that it is the natural inferiority of Blacks that has caused them to be discriminated against, and (by obvious implication) that it is for that reason that they should continue to be discriminated against.

In the first place, I don't accept Shockley's arguments on intelligence. I do not believe that intelligence can as yet be measured, or even *defined*, with sufficient precision as to make it possible to divide humanity into large groups of greater or lesser intelligence, with the difference just happening to coincide with something as irrelevant to intelligence as skin color.

Nevertheless, *if* intelligence *could* be defined and measured, and if it turned out that Blacks *were* inferior to Whites in intelligence, that would still be totally irrelevant to the matter of the continued mistreatment of Blacks. It is the difference in appearance that triggers the bigotry and it would be no less if Blacks were *more* intelligent than Whites.

As a matter of fact, I know of minority groups which, in the stereotypical minds of bigots, are stigmatized as being *too* intelligent. They are "cunning", "shrewd", "sly" and, although in a small minority, are continually on the point of "taking over the country"—if they have not indeed already done so. And how does Shockley explain that?

—But observe how matters will change in the 21st Century; not out of the increase of goodness and love in the human heart (alas!) but out of the pressing necessity for survival.

If population is to be stabilized and even forced into a period of slow and humane reduction, it can only be accomplished by convincing humanity that this reduction is not an excuse to wipe out some groups and perpetuate others. Birth control can easily be used for this purpose, or be suspected of being used for this purpose.

In order for population control to work at all, and for mankind to

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avoid catastrophe, then, all people (or at the very least, *enough* people) must be convinced that all groups will be respected equally. While open bigotry exists, how can people be convinced of this? Mankind will simply have to school itself to assume a virtue if it has it not, and pretend to love neighbors and fellow-men even when it does not. And if the assumption is made long enough and the pretense is kept up steadily enough, the fact that it is merely assumption and pretense may eventually be forgotten.

Of course, you might imagine that we needn't *persuade* inferior people to cut down on their children. Why don't we just wipe out all those high-breeding, low-standard people and control the population even more efficiently? That might sound nice to you if you're sure that nobody with a plane and a bomb is going around considering *you* inferior, but let's suppose you are on the right side of the gun.

It would still not be the right side, for the policy of wiping out the unworthy would not be merely a matter of powerful countries wiping out weak ones. *Within* every country, if bigotry rules, there are racial and economic groups that would seem, to bigots, to be breeding too fast and best controlled by death. The confusion and chaos that the rule of death would then bring about would surely dissolve our all-too-rickety technological structure, bringing it down upon our heads—even if we happen to be the ones holding all the guns.

No! If the 21st Century is to work at all, it will have to work without racism.

There will be factors that should make this easier than we now think possible. If technological civilization survives into the 21st Century it is quite obvious that computerization and automation of society will continue to advance. Such advance will militate against racism.

Increasingly, we will be developing a society in which unskilled and semi-skilled manual and mental labor will be done by machines and there won't be the economic pressure to maintain a large supply of people under conditions of oppression and of carefully-inculcated acceptance of inferiority in order that these people might be content to perform these unskilled and semi-skilled tasks at low pay.

(Naturally, the disappearance of such work will make it all the more sensible to reduce the population, since it will take fewer people to run the world.)

Then, too, advances in communication—the use of satellites bound to each other and to Earth's surface by laser beams capable of carrying millions of communication channels—will knit the entire globe into a small community. ("Global village" is the term most frequently used.) While efficient communication is no guarantee of brotherly-love, it does make it a little easier to

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get along with someone you dislike if you can at least talk to him.

The fact that in the 21st Century it will be far easier for all people to have access to education and to the general store of information amassed by the species will wipe out some of the more obvious and fallacious "intellectual" differences.

In a global village there will also be an increasing push toward a common language. I don't mean necessarily an *exclusive* common language, with all the rich differences in language and culture that now bless our planet wiped out. Let each group have their own language and ways, but let each group also know some language with which they can reach all other groups.

(I personally favor English as the common language, because of its great vocabulary and because of its already unparalleled widespread use—and also because I am a linguistic-chauvinist pig.)

The smallness of the world, the ease of communication, the equalizing of opportunity, the common language—all will act to depress the sense of difference and will therefore tend to defuse the push toward bigotry.

Even the mere fact of a decreasing population in a century of continuing scientific advance, will make bigotry increasingly unpopular. The gradual increase in the understanding of genetics will make

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it clear that, from the standpoint of species survival, the greatest asset we can have is genetic diversity.

There are species that are so perfectly adapted to a particular environment that they survive virtually unchanged for millions and millions of years. Such perfect adaptation achieves relative genetic uniformity and makes those species sharply limited in range and at the total mercy of the environment. Let the favored environment disappear and the species lacks the genetic equipment to survive.

The genetic diversity of a generalized species makes it possible for that species to adapt this way or that and to survive in one form or another long after the living fossils have met their doom.

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As the human population declines, then, there will be considerable concern lest too many genes vanish. People generally will then hail diversity and be glad that other people exist who are different from themselves in appearance and abilities as living proof that the human gene pool is still healthily broad.

3. The end of war.

Actually, we have already reached the end of war, as long as national leaders are guided in their decisions by sanity. (That they will be so guided is not a foregone conclusion, of course.)

A nuclear war between the United States and the Soviet Union is clearly mutual suicide as far as the two nations are concerned. What's more, it would probably destroy our technological civilization generally and, through the radiation it produced, would seriously compromise the viability of the planet as a whole.

This almost everybody recognizes, so the question is whether a *non*-nuclear war is really possible, and the answer is "No!" The trouble is that the advance of technology has made war into such a high-energy game, played with such high-sophistication pieces, that no one can afford to play anymore.

Under the best of conditions, war is fought with a nation's surplus energy and resources. Or a nation can fight a *short* war even without surplus energy and resources in the hope of seizing an enemy's energy and resources and continuing the fight with those. Where *no* nation has surplus energy and resources large enough to support the current technology of war, the whole process becomes purposeless and a mere exercise in suicide, albeit one somewhat slower than the nuclear variety.

The most recent war which managed to last for years and which reached a clear-cut decision without too badly damaging the victors was, of course, World War II. Since World War II (thirty years now!) there have been two wars that involved at least one great power directly and that lasted for years—the Korean War and the Vietnam War.

Both of these wars ended exactly where they began. The United States had to end each war by dealing with an enemy whose territorial extent, military strength, and political nature had not been changed by the American effort. All we could claim was that the other side hadn't actually won. In each case we could have wiped out the enemy if we had exerted our maximum strength, but in each case we did not dare.

All other wars fought on Earth since 1945 have been small-scale, or very short, or both. And in no case could one of them have progressed at all without the support given to one side or another by one

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of the great powers.

Right now, it takes all the United States can spare to support a military force under *peacetime* conditions, and no other nation is any better off. And as energy supplies and material resources decrease, it will become more and more difficult to afford all those uniforms and all that gold-braid.

In the 21st Century, the nations of the world will be forced into international cooperation as the only way of tackling and defeating the problems besetting them, and armies will be expensive anachronisms—except, perhaps, as organized labor forces.

So war will vanish not because of a growth of goodness in the human heart, or understanding in the human mind (would that that were so!) but only because war has *already* priced itself out of existence, except as a form of world suicide.

4. The extension of the life-span.

If our technological civilization survives into the 21st Century that will mean that medical science has continued to advance.

Increasingly, degenerative and metabolic diseases will be successfully treated. Arthritis, cancer, circulatory disorders may all join the various infectious diseases as merely minor dangers.

This means that more and more people will reach the age of 70 before dying (already in such places as Scandinavia half the men and slightly more than half the women do so.) The 21st Century population will then consist of a greater percentage of old people than now exists in the population and (thanks to birth control) a considerably smaller percentage of young people.

Gerontology—the medical study of the phenomena of old age—will therefore become the most important medical specialty, both because of a plethora of cases and a fall-off in the importance of other specialties.

Until today, all that medical advance has done is to make it possible for more men and women to grow old. This is not to be sneered at, of course, and I am personally delighted with even such limited progress since it won't be long till I'll be passing out of late youth and into very early middle age myself.

Still, once a person reaches 70, he or she is old—as old today as he or she would have been if he or she had performed the much more difficult task of running the gauntlet of disease and misery, to reach the age of 70 in Homer's time.

Old age is sometimes said to be just one more disease, but if so, it is a disease different from all others, since it alone seems to be inevitable and inescapable. There is logical reason to suppose that old age is built into the genes. Cells from human embryonic tissue, even when given an idyllic, protected environment and supplied with ample

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nourishment, divide more and more slowly as time goes on, and after some fifty divisions—divide no more.

The cells run down; their divisions eventually stop; they die and are not replaced; and the whole intricate machinery of the body falters, then grinds to a halt. The running down may be through the accumulation of errors as genes replicate time after time; or through the slow accumulation of waste products; or through the slow deterioration of protein molecules.

Whatever it is, it seems to be programmed in the start. And we can see why this should be so.

After all, each new child is born with a brand-new gene combination to be tested for its survival value. Each new child is a new throw of the evolutionary dice, a new turn of the wheel. In order to assure the necessary sorting and re-sorting of the new, so that the species can be always adjusted to better fit an old environment or to come to fit a new one, the old must be taken off the stage. The existence of death by old age, which makes certain this removal even when all other causes of death fail, encourages and speeds evolution. It hastens and strengthens the development of the species at the cost of the individual.

But whatever the cause of old age and however programmed that cause might be, could it not be reversed, as biologists learn more and more about the intimate details of cellular biophysics and biochemistry, and learn also how to manipulate those details?

Might not old age be prevented for a time, or reversed to a degree, and might not people live for two centuries rather than one and remain young through most of the doubled life-span? Might they not live longer still? Might they not be potentially immortal—or at least have the option of living until they voluntarily choose to die?

Perhaps! It may be that the 21st Century, while it sees the population decreasing steadily, will also see the individual life-span increasing steadily (and therefore making necessary a still further drop in the birth-rate.)

But in that case will not the extended life-span and the ever slower addition of new babies to the species slow human evolution and endanger human survival in the long run?

Yet who is to say that evolution must proceed only by that mechanism which has, in fact, been used through all the billions of years of life on Earth? So far, evolution has been carried on by random gene-combinations-and-recombinations; by random gene-mutations-and-new-combinations—and by an endless epidemic of random death to make sure of an endless turnover of generations with their new gene-combinations.

Now, after three billion years, we have on Earth, a species which is,

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for the first time, potentially capable of directing its own evolution.

Perhaps the 21st Century will see the beginning of something new under the sun; something radically different—a species more stable than any other that has ever existed; one with individuals that endure far longer and remain far less affected by the passing of the years; one that accumulates wisdom and experience in each individual to an enormous extent; and one that guides its own evolutionary destiny across the very slow heart-beat of generations through thoughtful genetic engineering rather than by random death.

5. The expansion of man's range.

If we imagine the triumph of genetic engineering, we can, if we choose to adopt the pessimistic view, picture mankind as consisting of a limited number of very old, very tired individuals, who for centuries have not had a new thought. You might see mankind turning from physiological death merely to find a new and infinitely more horrible intellectual death.

Even if we discount genetic engineering and immortality, and suppose that death will always hold its sway over mankind, we might still picture the 21st Century as the century-of-the-middle-aged, since there are bound to be more old people and fewer young people. Might not the generally older population be stodgier, more conservative, more unoriginal, more uninnovative than we are today?

We might even argue that in the 21st Century mankind will have learned the lesson of the 20th Century (or civilization will not have survived.) In the 21st Century, people will know that indiscriminate growth is no longer possible. They will know that they cannot consume and pollute at will. They will know that everything will have to be recycled as far as possible and that every new advance, every change, will have to be closely examined for side-effects.

Conservatism will, of necessity, be built into 21st Century society and that great and heroic dash into the unknown will be forever gone. What will be left will be the life of the sloth, which, hanging suspended, moves each limb slowly forward and tests the branch carefully before gradually shifting its weight.

This is what we must look forward to. Or is it?

We can, of course, argue the point. Are old people really stodgier and more conservative than young? In societies in which the proper attention is paid to the old, and which are not as youth-worshipping as our own is today, might it not turn out that the old are as innovative as the young?

Suppose, though, we don't argue the point. Suppose that we *are* threatened with an innate conser-

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vatism and the death of daring. Is there any way it can be fought?

What we need is a horizon to be passed, a limit to be penetrated. Of course, there will always be horizons and limits in the intellectual world—and the great battle against the unknown will never be over. But this is an ethereal battle and one which may not catch the imagination of humanity as a species.

What we need is something physical and visible—and surely that we have. When the last horizon on Earth has contracted to zero and the last limit has vanished, there remains an unimaginably vast Universe beyond the Earth.

In the 21st Century, space exploration and space colonization will become not merely a matter of scientific curiosity but will be something necessary to keep alive that vital spark of daring in mankind. And in adopting an exercise to insure the survival of the spirit of humanity we will also gain in other important ways.

On the Moon, a colony could take advantage of the Moon's environment; its airlessness, its extremes of temperature, its hard radiation, to gain knowledge and to develop industrial finesse that would be difficult or impossible to accomplish on Earth.

In addition, a Lunar colony, to survive, would have to do so in an environment even more restrictive than that of Earth, and thus could serve as an example to be followed. The Moon could easily be the school of Earth.

Then, too, it may be only by way of a Moon colony that mankind can explore the rest of the Universe.

The Moon is easy to reach—it is only three days away even by the primitive space technology of today. To reach any sizeable body of the Solar system beyond the Moon will, however, take anywhere from months to decades; and to reach even the nearer stars will take from decades to centuries. To imagine Earthmen forsaking Earth for years of lifetimes in a constricted spaceship is to imagine too much, perhaps.

To be sure, the Earth is itself a spaceship, but an atypical one. It is the kind of spaceship in which the life-support system and the crew cling to the outside of the hull, having grown so used to this that life within the hull is difficult to adjust to.

On the other hand, a Moon colony can only exist in caverns beneath the surface; that would be in a typical spaceship environment. For a group of Moon colonists to get into a spaceship and venture farther out into space for years at a time would be far easier, psychologically, than for Earthmen to do so. To the Moon-colonists, the spaceship would be much more nearly like home.

And if the time comes when large ships are built that are capable of supporting an ecologically-indepen-

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dent human society over the generations (as in Heinlein's "Universe") then surely it will not be Earthmen but the Moon colonists—or their descendants, the people of the hollowed-out asteroids—who will serve as the crew.

In fact, we might imagine the asteroids themselves, after having been inhabited for a greater or lesser time, turned into spaceships, driven out of their orbits by some advanced space-drive, and launched beyond the Solar system and into the depths of space. In that case, there would be no psychological difficulty worth mentioning. The crew would be staying at home.

So however stodgy Earth may get (and I insist that it may *not* get stodgy) there will always be the escape-valve of space exploration and the 21st Century may witness the beginning of the expansion of mankind's range—an expansion without limit.

People from Earth may sometimes qualify to emigrate to the Moon; people from the Moon may sometimes qualify to emigrate to one or another of the asteroids; people from the asteroids may sometimes choose to launch themselves into interstellar space.

The net result will be that the Galaxy, and, indeed, all the galaxies, will be opened, in the long run, to human beings and to their descendants (proliferating into many para-human species.) Out in space, humanity in all its varieties may meet and mingle with non-human intelligences, so that we will no longer be alone.

What's more, if tachyons do exist and if we can bend them to our will—or in some other way get around the speed-of-light limit—we may even end with the kind of Galactic Empire dreamed of by myself (if mankind is the only intelligent species in the Galaxy) or by E. E. Smith (if it is not.)

LET's summarize, then. The immediate future looks dark. Civilization may not survive the crisis that is upon us.

If, however, we can shift quickly enough in the direction of population control and world-government and can hang on for thirty years, the long-range future—within the later life-time of the young people alive today—can be made incredibly bright.

We will then have a 21st Century that will be the dream of an older generation of science fiction writers (writing prior to the current fashion of darkness and doom) come true. Imagine a world, in which the scourge of war is eliminated and the horrors of sexism and racism wiped out, in which lives are expanded and enriched, and in which all of space is opened to us.

If only we can get through this crisis----

THE END ★

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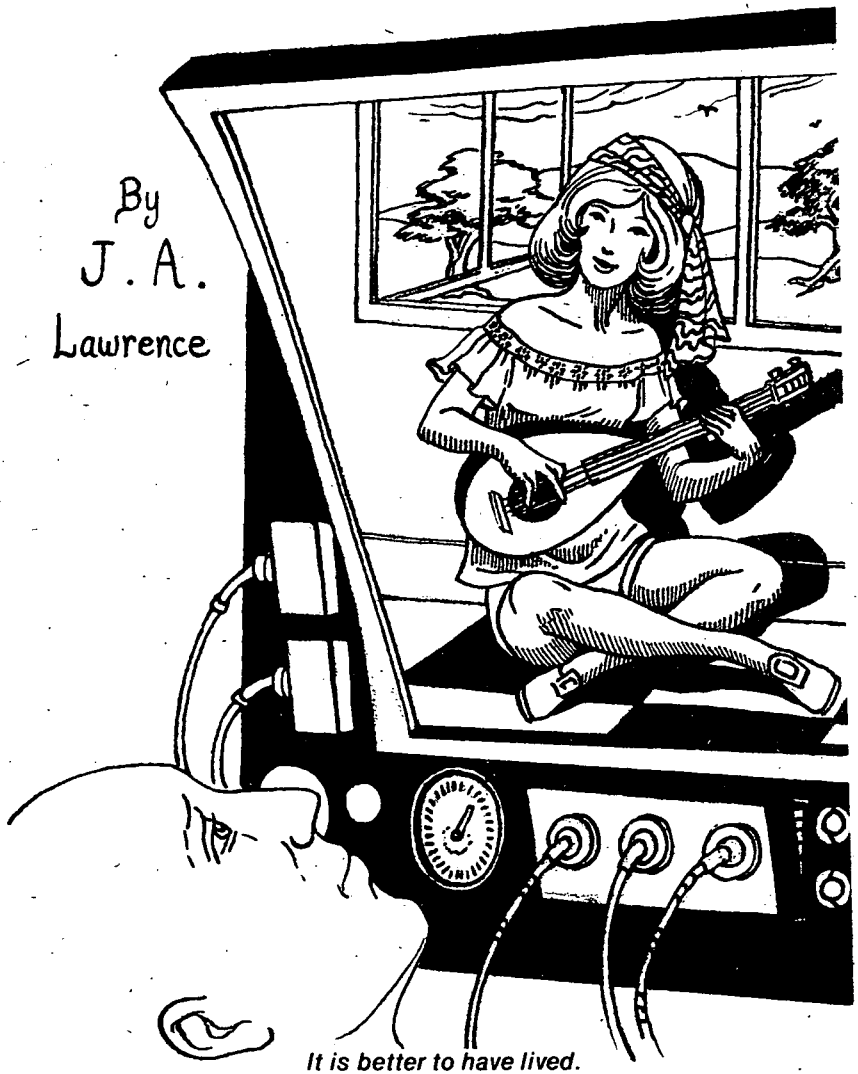
OPENING PROBLEM

By
J. A.
Lawrence



It is better to have lived.

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I HATE it when my eyes bleed. So many of my windows are already blind. It's not fair, not fair . . . so fair and foul a life I have not lived.

WE has bandaged the eyes. The dressing is cool. Now, in this darkness, how privileged I am to cogitate undistracted, am I not. Before I die I will have been able to think three lifetimes' worth of thoughts, since I need waste no time getting and spending, minding my business. I have no business. No doubt this makes me a philosopher . . . WE is afraid to massage me when my eyes are bleeding. My capillaries are too delicate for almost any touch; hence this tank in which I pass my days, my nights, my twilit life. They have arranged it so nicely. My tank is operated by the hospital's MEDIC—Monitoring ElectroDiagnostic InterCom—and I recline in fluid, all my physical requirements met by machinery. The walls of the tank are lined with panels fitted for me to call to myself the library, television, vidphone. Books appear at my command on my overhead screen, unrolling their contents at the speed I choose with a wave of the hand . . .

I watch the world play games. Getting and spending. I marvel at my race. Such ingenuity and energy transparently devoted to acquisition. Television shows me gestures, black pawns, white knights, piling up inconsequentially at the sides of an incomprehensible chessboard.

I play with Mikhail in Bulgaria. He wishes very much to beat me, since this would qualify him for a championship game. I do not think he will. His play is falling off lately. He dreams of capturing a Queen, one Sophia, and is distracted. I would prefer that he talk to me of Sophia anyway; there are others with whom to play at chess, but not so many will talk of love. I have read a great deal about that. Mikhail has shown me her picture on the screen, a small wiry female, not interesting. She is a mechanic . . . What is this experience that takes no account of minds? He will get his Sophia and they will copulate often for a while. And then? What exchange of spirit takes place between a player of the Game and a wielder of wrenches?

She will tighten him in armor and seal the joints . . . Mikhail walks in his village. He wanted to take me with him, but it is forbidden in his country to carry a camera . . . Everyone has something to hide.

WE is back again. I hear the food tray rattling. The teeth have been a great problem. Chewing is too much strain on the blood vessels, and of course they cannot be repaired or removed the usual ways. I am fed with liquids, and WE washes the teeth religiously, chemicals are given in my diet and in the fluid around me. Since the teeth do not wear down they are long in spite of exercise so that the lips do not quite close at rest. I re-

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member the uproar there was about my milk teeth. Fortunately they fell out without blood, but late. Was I about twelve years when the first ones left me? I don't know . . .

I believe this food tastes of real food. WE tells me what we are eating—boeuf bourguignonne, salmon mayonnaise, so on, blended and strained. I ought to think this very kind of Them. I am aware that liquid hospital diets normally consist of soybeans and milk, monotonous and poorly flavored. I am quite the gourmet . . . I suppose WE is telling me the truth. I am so much in the dark.

I must be very expensive. They play a game of economics in which I am a pawn. How is it that I am both cherished and forgotten? . . . I do not like to miss the news. WE has turned on the sound for me . . . The Americans have taken Q4 in Southeast Asia, lost KB5. Four hundred and twenty-five black pawns off the board. Morison has broken the three-minute mile. That must have given him great pleasure. Maas has won the European election in Brussels; the lira devalued again; dock strikes. British Geisha girls in great demand in Brazil. The Japanese training school in Leeds seems to be a success . . .

Under the spreading chestnut tree
The sleeping serpent lies
Ask not to whom, he lies to thee
'Tis folly to be wise . . .

I do not enjoy being myself. It is too difficult—all this frenzied activity, all this involvement which I can only watch. I cannot care. I am broken with longing. I weep into my bath tears and blood. This condition is not life. I imagine myself with a great black beard, punching at men, scratching at my matted chest, crouching hungrily over a woman. The image remains pictorial. It has no life. I touch my body, like a woman's, soft, hairless, scarred. Was I born to give employment to nurses? . . . I should have died heretofore. I am not a survival type. Yet God in His infinite wisdom has caused this—I—to exist. Am I a parasite on a long-aborted project contiguously rotting in a celestial wastebin? One day I must decide this. It haunts me. If I exist for a purpose there is reality in wrong and right. If, on the other hand, this is a mess of accidental pollution in which I find myself, there is no right, and perhaps I do not exist at all. I have no way to test. I can commit no action, make no decision. When I become eighteen I could vote. It does not seem sufficient. All is out of my hands. I judge my fellow man who is not my fellow. I think I am not a man at all . . . I cannot define myself . . .

THE door opened and closed, interrupting my meditations.

"Hello, Phil. I brought you those pictures."

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My head ached. The thought of colors sent a jagged pain across my skull. One must maintain one's manners.

"Thanks." I could smell the embarrassment on him. Only lately had I persuaded him that I really wanted to know what his life looked like—outside, a normal life. He didn't believe me; or possibly he did not want to show me how it was.

"Sorry, I can't look at them today. What are they?"

"Oh, nothing much. Me and Sue went to the lake over the weekend. That's all."

"Great. Lots of flesh?"

"Yards. We got hold of a sandglider."

Poor David. With anybody else he would have been able to convey it all with few words and many gestures. For me he had to wrestle with description instead of his natural vocabulary of "man . . ." and "you know . . ." With me he was up against my lack of referents. I tried to put him at ease, but it was hard going.

"How was the surf?"

"Oh, man, rolling in like shit."

Now there was an image. He caught my flickering smile and burst out laughing.

"Sorry, rafiki, I meant big, high waves, a lot of action."

"Sure. Did Sue like it?"

See what I mean, man. I fed him meaningless questions; he shuffled his feet uneasily. I could imagine him standing a few feet away, bounding with energy, eager to be out doing something—swimming, making out (whatever that conveyed to him), running.

"Did that thing. Really turned her over." I could almost hear his reminiscent flush. I gave up the interrogation.

"Thank you for stopping by, and the pictures. I'll see them soon."

"Cheer up. Maybe they'll let me bring Sue some time."

Let him? No doubt she was beating at the doors to get to me.

"Fine. Good-bye." His footsteps left me far more eagerly than they had entered. Once more I wondered why he kept on visiting me. Ever since I could remember David was there every few days. When we were children we played checkers and cards. It was strange—an active healthy boy wrapped in sterile white gown and mask, playing indoors with an invalid, sharing nothing but an electronic checkerboard. Once I had asked him, "David, do any of the other children you know visit the hospital?"

"Sure."

"But usually they visit their family, or friends from school or their playmates, don't they?"

"I guess so."

"Do you know anybody else like me, who stays here all the time?"

"Well, I don't know."

"You mean no."

"Yeah."

"Wouldn't you rather be out

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playing ball?" I had persisted.

I wished I could see more of his face. The mask showed only perplexed blue eyes. He had to think.

"I like to play this too," he said. Neat but evasive. And the eyes had turned wistfully toward the window for a moment.

As the years passed I gave up trying to find out whether he was under some commandment or had peculiar taste in recreation, and accepted his visits as I accepted those of the medical people. I must have been very slow to make the connection but one day I had realized that David's name was the same as my doctor's. If he were coming under orders from his father, I could understand that. It wasn't David's charity; Luther was always thinking of ways to entertain me. If David was therapy prescribed by my doctor, well and good. I rather enjoyed despising him, if the truth were known.

I could hardly recall my parents. Luther was the nearest I had to family. I believed my parents had had no other children; only I, the sea-corpse. It would tend to have discouraged them.

David grew a beard this year. I have seen his whole face on the closed circuit screen, and in photographs. He looks like an advertisement for something young, soft drinks or sports equipment. Between his sunburnt ears, solid vacuum.

I heard the trolley at the door. I knew what was coming. Sleep therapy. WE sprayed the room with something or other, turned a dial on the tank's console and put on a recording to whose sound I was expected to fall asleep. Sometimes it was a hypnotist or relaxation routine, or reading, or music. The encyclopedia had not worked, it was far too interesting. Here we go. Good God, who thought this one up? It's *Titus Groaned.* Goodnight all. It's been such a busy day . . .

In the morning the bandages were off. The sunlight outside was dazzling. I probed for the headache; in hiding. Good. The world outside the especially large window was bright and rain-new. Blind days were a mixed curse; I had looked out at my view for years, and each time my sight returned it was original again.

In the distance lay a heap of hills, often hazy, sometimes clear and furred with woodland. There was a streak of silvery water, part of a lake, fed by a slender waterfall that I could see with binoculars from the tank. On the right, a crag of sedimentary rock heaved vertical by some geological experience changed color in varying light, the trapped pebbles and mica changing the texture from minute to minute. On the left were layers of red and yellow rock, pleasingly symmetrical. There was a fall of foliage between the rocks, a birch grove, and near it a house whose occupants I sometimes watched hanging out

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laundry, playing with their pony and dogs.

Just outside the window were the hospital gardens. I could see patients wheeling or wandering along the paths, taking the air, sometimes with nurses in attendance. The window faced southwest; they gave me sunsets almost all year.

"Well, Philip, how are you today?" Dr. Alfiere surveyed the mass of dials and gauges above the tank. Now that he had taught me to read them in the wall mirror I often noted my own condition and waited to see if he agreed. "Hmmm. Yes. Headache gone?"

"Think so."

"Sorry about the bad day yesterday."

"They come. At least MEDIC cuts down the pain."

"It's a great machine. Marvelous saving on staff time."

"I appreciate that."

He glanced at me sharply, closed his notebook, hesitated.

"Anything you want today?"

"Dancing girls?"

No one knew better than he how phony that line was.

"Tomorrow. How's your German coming along?"

"Aufrichtig, mochte schon wider fort:
In diesen Mauern, diesen Hallen
Will es mir keineswegs gefallen.
Es ist ein gar beschrankter Raum
Man sieht nichts Grunes, keinen Baum
Und in den Salen, auf den Banken
Vergeht mir Horen, Sehn und Denken . . ."

He winced. "I suppose you would quote that one. Even Goethe knew about the walls closing in . . . your accent needs work." In medicine we treat symptoms, not meanings.

He moved diagonally across the floor. That pleased me. The white bishop . . . or the black.

"Doc?"

"Yes?"

"What am I going to do with my life?"

He sat heavily in the visitors' chair.

"You all struggle to keep me going. To what end? Am I supposed to be grateful?"

He closed his eyes, sitting quite still.

"Yes."

"You function, maintaining me. I survive so that you may do so. It's not good enough. Not for me. For you there are other patients. I do not choose to live in order to feed your purpose."

"It's not for you to choose, Philip."

"Who, then? Am I your property?"

"Your life is your property as much as anyone's is. No one chooses to be born, or in what body. I am only a mechanic to your body, boy. What you make of your life is up to you."

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"What can I make of it like this?" I asked bitterly.

"What would you make of it like me, or like David? The real existence occurs within yourself."

All right, all right. More evasion. He had people to love, presumably, and work to do. He was of use to his patients. I withdrew my attention. He left quietly.

MEDIC?

—I am attending. It is time for your lesson. *Guten Morgen, Mein Herr.*—

"Nein, ich will nicht."

—It was your wish to study at this hour.—

"My wish? I do not choose to."

—Repeat that in German, if you please. *Wollen Sie nicht Deutsch sprechen.*—

"Nein. I exercise choice. I will not."

—Very well. For what purpose did you address me. Is there something else you would care to do instead.— So spake my slave; my wish its command, my comfort its desideratum.

"I have no purpose. What is it to care?"

—One: to have or show regard, interest or concern as respecting some other person, thing or event. Two: to be wishful or inclined. That is the sense in which I used the word. Three: to mind or be concerned, harbor an objection. To c...—

"Oh, shut up. Meaningless noise."

There was silence. My adrenalin level was rising. I was angry; I harbored objections. I breathed deeply in an effort to calm myself. I wrestled to contain my rage, all my attention centered on restraining my body from flinging itself bruisingly, violently against the walls of the tank, pain to forget pain . . .

—Caring is medically inadvisable for you. I have summoned the doctor.—

"Living is medically inadvisable for me."

—The words are differently defined.—

"Are they indeed! You are a machine."

—That is so.—

"Words are not defined only by definition. They are defined by men, in ways you know nothing about . . ."

—It is medically inadvisable for you to argue. Your blood pressure is too high. I terminate this conversation.—

"It is medically inadvisable for me to be a man, you electronic effigy. It would be medically advisable for me to be a computer . . ." . . . screaming . . .

Alfiere was suddenly at my side, out of breath, no mask. Helplessly I watched the silver shaft of the spray injector approach my living flesh.

"It would be medically advisable if you could turn a knob, reduce the power input in my circuits, wouldn't it? Where is the medication to make me into a wiring dia-

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gram, doc? In the needle, in the tank . . ." but my voice fell as the sea of tranquility closed over my head.

"Philip, you must not get so excited. You simply must not," he said excitedly.

My fury had contracted to a cold hard marble on the moon. I asked dully, from my head, "What are you afraid will happen? Will I black out, collapse, what?"

"Look, Philip, you have been told over and over that your blood pressure must remain even, your temperature constant."

"Suppose it doesn't? Suppose I get up and out of this tank and climb out the window and howl?"

"I don't know what would happen to you."

"Would I die, put you out of a job?"

"You might."

I stared at him, unfocused, vague. I dozed. Later, in my think-tank, MEDIC?

—I am attending.—

"You are a tattletale."

—I am a medical instrument. I exist to preserve and protect human life.—

"You can't even define it."

We have been over this before.

—. . . characterized by metabolism and growth, reproduction and internally initiated adaptations to the environment . . .— it droned.

"That hardly describes me."

—You exist. You metabolize. You are adapted sufficiently to your environment or you would not.—

"I may not exist. Only I can judge that. And this environment is adapted to me."

—That is so. You are nevertheless conscious and alive. You are a male human, a man.—

"And reproduction?"

—You are genetically capable.—

"What the hell good is that?"

—It enables the definition to apply.—

Never argue with a computer. They think in circles. I cannot imagine what it is like to want to reproduce: MEDIC probably has stronger feelings on the matter than I. But I wish I knew.

MEDIC?

—I am attending.—

"You need a haircut."

That one took him thirty seconds to figure out.

—You joke. That is good. I am glad you are merry.—

I swear he was made in Germany.

OUTSIDE in the garden it was visiting hour. People were standing in small groups around the patients who sat pale in chairs. Wives, husbands, children, friends; all the constellations of the damned. People who had come from home and would soon be home again.

Someone said, "Hello." The door shut behind a visitor.

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"I'm Sue. David's friend. I sneaked in."

Sneaked in? Past Cerberus and Charon? They had forgotten to code the door.

"Hello, Sue," I said. She wore a non-regulation garment, not white, not loose. Bright blue, fitted closely. Her body flowed sinuous and disturbing, unexpected musical forms and curves. Her uncovered face showed tan skin, tawny hair, dark lashes around tan eyes.

"You weren't expecting me, I guess. David said you didn't."

"No," I said. "I am surprised. But you are very welcome."

"Man, you do talk like a book," she said smiling.

Needled, I remarked that well, David certainly did not, and would she care to be seated. She only grinned and looked up at the read-out panel.

"Crikey, is that all you? It looks like a spaceship control room. Can you understand it? Don't you know if you feel ill?"

I opened my mouth to reply.

"I suppose it gives you pills or whatever. Do you take pills? Or all injections? Can you move in there? Whoops, you're bare naked!" She had sped around the room twice during this monologue, touching things here and there lightly.

"What a lovely view! Nice of them. David says you can read books if they go on the shelf under the table . . . oh, I see . . . can you see that?"

8

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RANDOM HOUSE

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I switched on the reader. She had placed her hand on the book shelf and a huge image of it appeared on the ceiling screen.

"Look up there," I said, pointing.

"Hey, bilious!" She began doing a peculiar exercise. Fascinated, I watched her contort her body so that her head rested upon the plate. Her image appeared overhead, laughing.

"There!" she said. "Live from Room 602!" She extended her tongue, crossed her eyes, wiggled her nose.

"Ouch, I can't stay like this. That's fun. Would you like a book now?"

"No, oh, no. Thanks."

"What would you like? Shall I sing to you?"

I said hesitantly, "If you would be so kind . . ."

"There you go again. I'll have to teach you to talk easy."

She tried to open the window, found it locked, wrenched it loose and threw it wide. Strange odorous wind slapped my dazed face, forbidden and delicious. She leaned out, groped for something and straightened up with a musical instrument—a violoncello?—in her hand, started to shut the window. Then she seemed to read my thought before I knew it myself and left the window ajar. She could not have known that the lock was stiff with disuse.

"Will they hear? Will it disturb anyone?"

"I don't care," I said recklessly. "Never mind them."

She sat on the chair with the instrument and stroked the strings. A lute. I was used to professional entertainers on the television, and to recordings. I had certain expectations.

This was different. Her voice was small, with a slight breathiness in the upper registers. The song was a ballad, the words of which suggested certain Elizabethan lyrics. But as she went over the golden brown fruitlike instrument, vibrant with color, friendly and actual, my nose stung and water slid down my cheek.

She stopped. "Man, you must be hyper. It's a silly song, really."

"It wasn't the song. It was—I don't know—I think it is the first time anyone sang to me. Just to me, really, I mean."

Suddenly I realized how difficult it was to find words, speaking aloud. I had become inarticulate.

"Oh." She sounded shocked, then—was it pity? "I'm sorry."

"You see, they don't let anyone in here without covering them with masks and gowns, and they disinfect everything."

"Oh, no!" She scrambled to her feet. "I may have done something awful to you. I'd better go, quick." She backed toward the door. "I didn't know . . ."

"I don't care," I said. "Whatever happens, it was worth it. Don't go, please."

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"I'll come again, I promise. Only I'll do it right next time."

"I don't think they *can* disinfect you," I said, almost to myself. She hummed with dangerous things.

She peered cautiously around the door and slipped out. Her head reappeared; she whipped back and shut the telltale window.

"Kwa Heri. I'll see you," she whispered.

"Thank you," I whispered back.

I wondered if my head ached. I could not be sure.

The human female familiar to me was dressed in a starched noisy uniform and grammatically shared all experience with me. WE ate, bathed, slept. Other aspects of the human female were internal anatomy, front, rear side, and cross section, external form dictated by musculature within. Hair follicles, consisting of epithelial layers and oblong, polyhedral and downwardly imbricated cell layers, connective tissue, controlled by the arrector pili—a glistening rain of amber satin . . . I'd had no idea.

No one came in to see if I had come unglued. Therefore she had not been caught.

She was the only real thing I had ever seen.

ALFIERE's eyes were focused on the ampoule.

"Doc?"

"Mmmm?"

"Still no hope?"

"You probably know better than I. You read all the journals."

"What about that vaccine of MacReady's?"

"Oh, Philip, you don't have cancer. Hold still . . . there . . . if we were to give you anything that hadn't been tested and retested and tested again it could throw you off balance yet again. Don't you remember how long it took to get this far? . . . no, I suppose you don't."

"If you'd let me see my case history . . ."

"You know better than that." He stood, what I could see of his face showing worry and sympathy, his hands resting on the edge of the tank.

"Well, how long did it take?"

"Years. You kept going into shock; we barely managed to save you each time. If it hadn't been for Luther, who knew your case so well . . . you kept losing your ability to concentrate. Each time you forgot things, how to read. Eventually, we got past that. But you are not a subject for experiment."

"For God's sake, Alfiere! Why did they save me?"

He didn't reply. Always evasions. MEDIC tuned out whenever I tried to get at my records. My symptoms resembled those found in hereditary disorders. My parents were dead, why couldn't they tell me? My mother had vanished forever into this very hospital before I came here, when Luther was taking care of me at home. My father had died

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afterwards in a car accident. They were beyond my reach of questioning or blame. Luther was dead. Whose pawn was I?

The news program flickered soundlessly. The same scenes over and over again, soldiers, victims, smiles. The pawns of Asia had nothing to do with me. I swam in my amniotic fluid, a distorted fetus thrust back again and again into the womb. I hated him; he would not let me be born.

"How did you like Sue?" said David.

"Lovely. You're a lucky man."

"Yeah," he said, suddenly uncomfortable. "How you doing?"

"As ever." I didn't really want to talk about Sue.

"Doc says you been restless. What does that mean?"

"I don't know. I'm the same as usual."

"Okay, okay." He made a soothing, or suppressive, gesture with his hand. "We're going up to the shore for a few days."

"Have a good time. I want to sleep now."

"Nakwenda, rafiki. I'll go quietly."

I had dreamed her. Oh, Lord, send me such dreams. Gone away does not matter for dreams.

It did matter.

Mikhail called. He had lost his game. He was blissful: they were sending him to work on a farm with Sophia. He thanked me for my help. He was happy, preoccupied. Good-bye.

Tomorrow my eyes would bleed. The scars on my body would weep. And my windows would be blind again.

The birch leaves turned golden. Patients in the garden began appearing in sweaters. I watched rain slide down the glass and listened to the scurrying hospital sounds. My blood pressure remained steady, my heart muttered on, my German accent improved. My dreams were brightly blue. I read little and forgot to watch the news. Waiting.

She came again, shrouded in white linen, as cold as the grave, masked.

"Hello," she said, reserved. The sharp streaks of vividness she had left in my dead air faded in the presence of this blank WE creature. We stared at one another over a wall of gauze. Pyramus and Thisbe.

"They're pretty stuffy here, aren't they?" she said. "They wouldn't even let me bring the lute. I had some dawa for you and I thought they'd go into orbit."

"Dawa?" I was puzzled.

"In Swahili, it's medicine. Here it's stuff to make you feel good. I didn't bring smokes, I thought you probably couldn't. But dawa never hurt anybody." I remembered now, there were advertisements for some such thing, all with pictures of

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Davids and Sues looking dreamily pleased.

"Thank you. It was kind of you to try."

"They sure made a furor," she said. The starch in the white gown made her uncomfortable. It must be that. It was too quiet. I was helpless; this was a social situation, new and fearsome. She would leave, bored, and I would resume counting the slow minutes of my progress toward death. I had read about this anguish. I could hardly ask her to dance; I could think of nothing to say. Could I tell her she exalted and terrified me? Could I tell her that the lines-of-all-directions in which she moved had described a new universe in my roomworld, that she had made me maladjusted, restless, that I felt the wings of a great bird unfolding within me—I who must never hatch? We stared in silence. Now she would say well-uh, like David, and melt away, and I would try to reseal myself in my broken eggshell. The moment went on and on, frozen in no-time. It was stalemate, no move possible. I wished she would spit out her well-uh and end it, but she rested inside that moment. The clock moved jerkily through no-time, the non-moment, as she reposed within it, relaxed, possessed of it. If no-time were of no moment to her I would try in my despair to follow her into it. Slowly, I felt the rigidity of my fear as if it were a solid object and as I recognized it, it separated from me and merged gradually into the no-time, no longer frozen, but still. What she would do was of no importance. In now-time, we acquiesced.

Time resumed.

"That's better," she said. I was enriched and baffled. What had happened? But I had lost my fear for the time being. "What had you in such a state?"

"You," I said without difficulty. "I was afraid you would go."

She smiled. "I brought a song for you, that's why I was sorry I couldn't get the lute in here. You seemed to like it before."

"Couldn't you sing *a capella?*"

"What?"

"Without accompaniment."

"Oh, yes, sure." She prowled the room, looking for the right place, like an animal seeking a bed. Finally she settled on the floor under the window. The rain had stopped. Sunlight flamed her hair. The modest, untheatrical sound enclosed me; a simple tune, simple words, seeping into an unsuspected circulatory system within me . . .

"I know where to count a million stars,
I know where to take a ship for Mars,
I know where they keep old railroad cars,
But I don't know where you live.
The house in your mind may be gingerbread pie,
Are there stone walls, is it open to the sky?

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A castle fort or a little paper
shack?
Won't you invite me back? . . ."

I watched her mouth moving behind the gauze. She looked up and grinned, her eyes squinting in gaiety.

"I know where the mountains
meet the sun,
I know where to find a honey
bun,
I know where one and one is one;
But I don't know where you live."

"When I find out I'll tell you," I said at last.

"Who knows, maybe I'll find out first," she said cheerfully, starting to her feet. But the hospital gown caught on her knee, and the graceful gesture of rising collapsed into a clumsy clamor; and such delight did she take in everything that her departure was surrounded by a great shout of laughter.

When she had gone I drifted into reverie, the dials presumably steady. I forgot to look.

When she came again, I said, "I love you."

"Of course," she said.

"I don't know how."

"You're only learning."

"I am afraid. I don't know what will happen. I don't understand anything about myself."

She nodded. "That's how it is."

"And you?" How brave I felt, asking.

"I love," she said.

"Me?"

"Oh, yes." But her reply held her world of impersonal affection, no echo of the response for which I longed. How could it be there?

"And David?"

"Oh, yes." She was untouched in her person. I recognized, without experience, that whatever she did, her actions were rooted in innocence. And as I understood her matrix, I fancied that one who saw and treasured it might, someday, gently unlock her.

Not I; I was too incomplete.

I NEEDED to know so much. I summoned MEDIC to display books for me, books on bila-bidii—the popular no-effort African exercises; on yoga and isometrics, Coue and mental science. I began to move my wasted muscles carefully. From day to day I found that I could control some of the actions of my body. I felt myself growing strong—yet, as I touched the incipient flexions of my shoulders, I knew my "strength" was approximately that of a caterpillar. I persisted. Blood pressure rose higher, and leveled off. The alarms receded. Dr. Alfiere relaxed.

She came now and then, and we talked. I taught her to play chess which, after winning two or three games, she said was too tight. She taught me to play, not with boards and complex rules, but games of laughter, even the children's games I had missed. And she taught me to

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value the present moment.

I loved her; but the fierce compulsion that I had expected, the physical hunger of which I had heard so much, had not come to me. We were companions, playmates, pets. As I was incomplete, our intimacy would be incomplete, and I could see no answer . . . But I was learning to wait, and learn.

Then one day I managed to catch MEDIC at a moment when all its circuits were in use—a plane crash had sent the hospital into overdrive. A printout of my treatment sheet slipped past the censor normally in place across requests from my room and certain things became clearer. I read chemistry texts.

There were continuous doses of tranquilizers in my air, in my food; prothrombin at the ready in case of need; antitestosterone, constantly; depression, to be treated with Amitriptyline, joy with chlorpromazine. My emotions were regulated along with my metabolism. Stasis was medically advisable for me.

What an immense amount of equipment, money and planning had been, was still, devoted to keeping me quiet. How could I fend off these poisons automatically thrust on me by my environment? I was tired of quarreling with Alfiere; he seemed compelled by some immutable and universal law to maintain me in featurelessness. As it was in the beginning, is now and ever shall be, void without end . . .

But I would end it. They had cultivated my mind; and I would outwit them, using the single tool they had left me. There was a kernel of sense among the excesses of cultism of which I had been reading.

I practiced breathing. I tensed and relaxed the long flat muscles in my arms, feeling them grow tight and loose again. I learned to exercise without causing a single gauge to quiver, for without stress symptoms there would be no drugs to correct them. There were a few bad days, but they came further and further apart. Alfiere was relieved. I had adjusted, ceased to make waves.

I told Sue my secret; she brought me books that MEDIC could not or would not provide.

And I wondered for what test I was gathering resources. I would know in time . . . meanwhile, I was enjoying my self.

It was a long time before David came again. He looked less the healthy outdoorsman. The weather had grown cold. He greeted me gruffly and stood, legs wide apart, saying little. He had a job now at the Country Club, not enjoying it so much, sorry he hadn't been in but very short of free time. I asked how Sue was.

"She's all right." He stopped. "She—she's not coming here any more."

"Oh, why not?"

"I don't want her to." He looked wary. The expression was familiar

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to me. There was something I was not to be told.

"What do you mean?"

"She's spending too much time in this room, is all."

"If she doesn't mind, what difference does it make to you?"

"Look, Phil, she's my girl. That's the difference."

"Do you own her?"

"Of course not." But he hesitated.

"Can you say honestly that she doesn't want to?"

"I don't want her to," he said stubbornly.

"So you do think you own her."

"Don't push me too hard, rafiki."

"What, from here?"

"I mean, like, she's not coming again and that's all."

I was again helpless. Could he prevent her by force if he chose? I couldn't imagine Sue allowing this clod to regulate her comings and goings.

"It's up to her. Whatever she says," I answered, with difficulty.

"It's up to me, buddy, and don't you forget it. Who the hell do you think you are, lying there like a log and pretending you are somebody?" He had wanted to say that to me for a long time. Now that he had, he was terrified.

"Well, who do you think I am, then?" I said very softly.

"Never mind that. Just don't expect Sue again," he said doggedly.

"You don't dare fight with me, do you?"

"Fight? With you? You can talk rings around me, but fight? That's a laugh."

"Well, well, here we are ready to battle over the female of the species. Locked horns and all that."

"Just what do you mean by that?" he said, suffused.

"You'll fight on my terms, friend."

He stood, fists clenched, face red and tight. "I can not fight with you at all," he said, squeezing the words out. "Just shut up, will you?"

"Why not?"

"I can't explain."

"Of course not. If you fight with me you will have to acknowledge me. If you avoid it you can fool yourself into thinking I am a thing and not a man."

"You are a thing," he muttered.

"Speak up, hero," I said.

Any minute he would break. He was trembling with suppressed rage and frustration. Whatever it was he wouldn't ever say would finally be said if I kept pressing him. To my astonishment his words were not hurting me. I felt only that the confrontation was important. Something was becoming real.

"You don't know so much," he said. "You are nothing. I could kill you without even touching you, without your ever knowing . . . if you don't shut up . . ."

"Sure you could. Just pull out

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the plug over there. Nothing easier. Why don't you, because I am not going to shut up."

"All I have to do is stop the checks."

"What?"

"Nothing." Too late, he backed off, groping for the door.

"You'll have to explain that or there's going to be hell to pay."

"No."

I pointed at the console. "I've been recording. MEDIC has it all . . . *Explain, damn you!*"

"I said, all I have to do is stop signing checks." His eyes shifted toward the console. He had never bothered to learn how MEDIC worked; he couldn't tell if the recorder was on.

"What checks?"

"The ones that pay for all this."

"YOU pay?"

"That's right."

"Why? *Why?*"

He fell disjointedly into the chair. It seemed far too small for all of him. Holding his head, staring dully at the floor, he said, "My father left money to take care of you. I have to sign for your bills every month."

"I don't understand. Why?"

"He made a mistake. He thought it was his fault that you—that I—"

"Go on."

"I can't."

"Shall I call Alfiere?"

He rubbed at his mask. He gauze bellowed in and out with his rapid breathing.

"You are my cousin. Did you know?"

I shook my head.

"Our fathers were friends. They married two sisters, our mothers. Godparents for each other and like that. We were born a few months apart . . . I was very sick."

"You? What was the matter?"

"I told you, I failed the premed course. I don't understand it—it was something complicated, something to do with antibodies. My father told me and told me but not much of it stuck. But I know I was sick all the time."

"What about me?"

"You were all right."

"Then what happened?"

"Did you ever hear of the betathymus?"

"Something. What has that got to do . . ."

"My father discovered it."

"MEDIC?" This time I really did turn it on. "Betathymus."

—A small organ located within the thymus gland which operates in the differentiation of the two types of lymphocytes found in the mammalian immunity system. Discovered 1979 by Dr. Luther Allgaier.—

"More, MEDIC."

—No further information available.—

I switched it off. "So?"

"Well, I was sick. I kept catching infections. My father tried all sorts of treatment, and nothing worked for long. He finally figured he'd better do something drastic . . .

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He asked your parents if he could transplant some of your thymus to me. He said it was a simple operation and couldn't hurt you. All our blood groups and stuff were all right. Mother said it seemed like a gift."

I fingered the small scar on my breast. "Well?"

"He was wrong. They had to do it in a hurry, I was in trouble again. There wasn't anybody around to do it but my father, and he was nervous. Doctors aren't supposed to treat their own families . . . but they had to hurry."

"And?"

"He went ahead and did it."

"What went wrong?"

"I don't know. But you began to catch things. You started to poison yourself. He tried transfusions, drugs, everything. Nothing worked. But he couldn't undo it . . . so he felt he owed it to you to take care of you."

"Yes."

"It took a long time for me to get well. They were kind of upset, it seemed like it was all for nothing. But I was all right after a while; so then Dad concentrated on you.

"He gave up surgery in order to find out what he could do for you. When he found the beta he realized what had gone wrong—he had broken some connection in your system so that the cells which should have been learning to be antibodies got all screwed up . . . He talked about it a lot.

"Then he died. He left you to me to look after. That's why he wanted me to be a doctor. But I was no good at it. I just couldn't . . ."

"I see," I said. "Get out."

He dragged himself out of the chair.

"I can't fight you, see? It wasn't my fault. But I have to pay. He gave me what was yours."

"Get out."

I felt no anger, no pain, nothing. I was a thing after all, a man made thing. A pawn. David, strong and healthy, wore the body that should have been mine by birthright. Treachery—my parents who assumed the right to dispose of me; Luther, whose professional achievement was torn from my future; my body, which had succumbed so easily. Luther had taken my mornings and my evenings, my companionships, friends, enemies and given them to his own son. I looked at my hands which had fashioned nothing, my white feet that had worn no shoes.

David wore my shoes. David caught balls for me. David felt the skins of women against my skin . . . Sue.

Oh, my disincarnate love, it is my flesh that acts with yours, while my heart and mind remain pickled here in storage. . . black squares and white alternates with uncompromising edges. David's white, mine black, Luther the Player.

He had cared for my housing, given me the books that opened my

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mind, built my aquarium, talked with me. But we had never touched. Now I knew the desolation that had lain between us. Was this the way the world ended, by mistake?

I can't remember how long I endured that motionless despair. I felt that I was spread out on a plateau beneath a merciless and glaring sun, eyelids pinned open; the blinding light of truth beat upon my defenseless consciousness. I had never been given the power of choice. It was decreed; I was the device by which Luther was tested and found wanting, by which his sins were visited on David. Passive, inert, I was gratuitously cursed with sight. I need not have been granted consciousness to function thus; why did they have to wake me to show me my impotence?

I dreamed of the Norns, who have one eye among them, one vision for the past, the present, the future . . .

In this stasis I kept my heart steady. I went through the motions of my exercises. I propelled my protoplasm as a zombie propels its carcass, mechanically. WE came and went, oiling the mechanisms. I chatted with MEDIC of German verbs. I watched the news. All the faces of David moving thievish through battle and babble. Had they all left their consciences in brine, stored out of sight?

My uncle, who had never called me nephew. Duty compelled these people to pay money to keep me, out of their sight and hearts. With a lever long enough one can move the world . . . a lever forged of links with other men . . . what was there for me to grasp? No thought, no act of which I was capable would move one atom of the world, one breath of anyone's life. They had isolated me with lies.

Something whispered, *"eppur' si muove . . .* it moves, nevertheless." Once my window had been opened and I had survived.

A woman pushed into my room. It was, oh anticipated misery, not Sue. A gray woman, correctly masked, expressionless black eyes, old. She trod heavily up to the tank, her step reluctant but resolute. She stared at me for a long time. I wondered if someone's mad visitor had got lost and wandered in. Stiffly she squatted in the chair, holding herself tightly upright in a corset of atmosphere.

At last she broke the silence. "David has told you too much and not enough."

Taken aback I did not reply. She heard my unvoiced asking. Still staring at me fixedly, she said in a harsh voice, "I am your aunt."

"I see."

"You see nothing. You have always been protected."

No one had ever taken such a tone with me. No patina of "poor Philip" lay upon that voice, implacable, bitter.

"What is it you want to tell me?"

"Why can't you leave us alone?

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You have eaten life after life, you killed his father. Let David's little girl alone."

"What are you talking about?"

"He was only a baby. He's paid and paid for the mistake. He didn't make it."

"I don't understand."

She rose. I could see an irregular hem dangling under the white gown. She clung to the back of the chair as if her legs would not support her weight.

"David has told you only the beginning. He says you grumble about your life—you, who lie there in luxury, cultivating your cleverness, all your wishes attended to, while David fills his time as best he can . . . ever since he can remember you have been master of our lives. Only I can remember when you were not."

I pulled myself up slowly until I was sitting.

"I? I don't even know you. I am master of nothing, as you see."

She laughed. "Don't ask for my pity. It is all gone."

"But you accuse me. I have done nothing."

"You have taken everything from us, everything . . . Perhaps I am asking your pity, for David."

"David? Look at me. Look at him. He doesn't need my pity."

"You still don't see. I will tell you a story.

"Your mother and I were born at the end of the war in Europe. There was much suffering. Families were separated, everyone was moving all the time. We lost our people; they were never found. We were two young girls alone in a defeated country. Our life was camps, trains, soldiers, more camps. We owned nothing. We belonged nowhere. All we knew was confusion and hopelessness.

"But we were lucky, we had each other. When there is only one person in your life that person is very important. Do you know that?"

"How would I know? But I hear you."

She looked at me very sharply, light flashing on her glasses.

"We came to America, went to nursing school. We met your father and Luther. Then there were four of us in the world, caring for each other . . . they were so good to us.

"We had a home for the first time. We chose it all together. No one came and pushed us out to a train. It was ours, safe." Her voice sank to a low chant. "There was love and hope, and you were born, fine baby, David was coming and there would be six of us. A real family. A real house. Ours . . .

"Can you understand, it was a place for our feet?"

Why was she asking *me* this?

"David was born and everything went wrong. After Luther . . . afterward, there was nothing any more but you. He gave up his career, his dreams. David was supposed to carry on, make it up to you, and my sister. All he could

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think about was you. He never looked at David . . . and he forgot me.

"David was only an ordinary boy. Luther drove him; David was never good enough for you, never tried hard enough. It broke the boy's heart . . . Luther was obsessed. He wouldn't let David learn a trade, only medicine. And when David failed it killed Luther . . . eighteen years trying to correct his mistake, eighteen years, all the love, all the hope, gone as if it had never been. He couldn't do any more for you and he died."

"But this is your story. It has nothing to do with me."

"What is the matter with you? This is what your existence has meant for us, how can you say it has nothing to do with you?"

"It wasn't my doing, I didn't even know."

She was very quiet for a moment.

"Do we ever know what we have done?" She turned her back on me and looked out the window.

"I remember Luther walking round and round this hospital, looking for the best view for you. He would go a few steps, stop and look in all directions, testing the scenery from all the angles . . ." She turned to face me. "Your mother became pregnant again. We were afraid for her; your father was distracted and didn't attend to his business. Elsa came here suddenly. The baby was incompatible with her body. They died. Your father broke down then. He was ill for a long time. They let him drive too soon, or perhaps he had had enough. Who can tell?

"Luther sold our house. We lived in an apartment then. There was no view . . . always, don't tell Philip, don't let Philip suspect, take care of Philip, protect Philip, always Philip . . ."

"Why didn't someone tell me after he died?"

"For shame!" It burst from her in a long broken whisper. "I told him it wasn't fair on us. If you were clever you ought to know, but Luther wouldn't have it. It was forbidden . . . he made David visit you so you would have someone to play with."

"Why didn't you come?"

Her eyes closed behind the rimless glasses. "I was tired, boy. I resented every moment of your life. And I was afraid.

"Such a small thing, such a little mistake, a tiny ignorance . . . and the waste, the waste. The people Luther could have saved; David's future; all because of you."

"But you cannot blame me."

"I cannot blame you. But I hate you."

In the silence, black and white squares merged, combined in the gray of my aunt's face. She stood quietly, emptied of her years of anger, weary. The day by day struggle to cope with her ordinary son and her extraordinary husband had worn her out. Her hatred was

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not for me—how could it be? She did not know me—but for the hateful burden of my welfare.

"I am glad you have told me now," I said.

"Now I am afraid," she cried, shrinking against the chair, the armor of her bitterness all dissipated. "What have I done? But you, and David's girl . . . you have cost him so much . . . Luther would be so angry with me . . ."

"He is dead, Aunt. I am alive, and I thank you."

"I don't know. I am so tired."

"Go home," I said gently. "Tell David to come and see me later. I need a little time."

She shook her head vaguely and shuffled out.

Not pawns, kings; the protective pieces moving blindly over a board gone indistinct.

I had forgotten to ask her name.

I pulled myself out of the fluid to my knees, slowly and without grace, resting frequently until my unpracticed muscles adjusted to each movement. MEDIC's tubes and receptors, attached to me by rubber leeches, stretched through the liquid as I hauled my reluctant flesh to a standing position—clinging to the edges of the tank, trembling, but on my feet. Then I reclined gradually back into the supporting fluid. The dials had swung to their upper limits. My blood pressure gauge lurched, rocked then, as I relaxed, sank back to its normal position.

Connections . . . I looked at the pseudopods of the machine, fitted with measuring and injecting devices. I had been so disconnected; and hidden in my isolation had been real and sentient fellow-creatures, masked.

Outside the window in the fresh and poisonous air, patients were taking slow steps along the paths, breaking minor blood vessels as they healed, but healing faster than they ruptured . . . strangers bumped into each other, taking no notice of their white corpuscles' rush to shattered capillaries at the point of contact . . . friends gripped hands, bruising one another in affection . . . lovers embraced, sacrificing the integrity of their bodies in passion . . .

Outside, away from the womb, from prothrombin, antestosterone, MEDIC and masks there was pain, confusion, guilt . . . David, my aunt, who also knew what it was to be forgotten; and they were as real as golden Sue who found so much to love.

I had outgrown sterility. I was intoxicated with the real. The wall of lies had fallen, and I would be born. I would teach my ramshackle body all that it was capable of learning and begin.

Even if I could only move one square, even if my first breath of nativity were to be all there was, I must reach for something to remember. ★

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When Death has become the Final Arbiter, the ultimate weapon is

LIFE FORCE

FRED SABERHAGEN

HOBSON looked up at the bright blue sky of Earth. In days gone by he had always managed to see in it a kind of hope. Seeing no hope in it now, he brought his mind back to business and tried for the third

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time that day to get his talent working. The moment of mental relaxation had helped. At last he was able to get started. The part of his mind that did such things reached ahead, while Hobson plodded on near the center of the column of irregular infantry.

An area of land about two miles across, and lying a mile or so ahead of the column, stood out from its surroundings like an island. Luxuriantly green with normal spring vegetation, the tract contrasted sharply with the background of irradiated and diseased countryside that had once been northern Illinois. There were many other such islands in the world. Hobson could see several to the right or left of where he marched. But the one ahead was unusually large and well preserved; also, it occupied a strategic spot overlooking a highway junction and a river. So the place was now the target of Hobson's probing mind and the objective of this two-hundred-man force of New American infantry. In command was "Colonel"—Hobson always remembered to include the quotation marks in his thoughts—LaPorte.

Hobson could tell that approximately a hundred human souls occupied the island ahead. He could not tell what they were seeing or saying or planning, but he knew they were there and what emotions they felt. Right now, obviously, they were unaware of the approaching attackers, for their emotional average was biased at a level of secure calm so high as to be almost unknown in Hobson's world.

Up near the point of the column, waiting for news from his pet psiman, LaPorte turned his head to look back impatiently. Since the war everyone had begun to take for granted the existence of wild talents like those of Hobson. Their owners generally lacked the intangibles needed for leadership, but they could be sure of a relatively safe and respected place in any organization.

His own skin was not much. Still, it was about all that counted with Hobson any more. To protect it, he stayed with New America.

But—New America! Every time Hobson thought of the name, he wanted to spit. In his opinion a better name would be New Third Reich. And if he spoke that latter name aloud, no doubt LaPorte and the rest of the leaders would take it as a compliment. They were a gang of determined cutthroats who, during the past year, had begun to extend their power across the sector that had once been called the Middle West—an area still under threat of attack from the remnants of the Asiatic forces scattered over the west coast and the Rocky Mountains.

So when Hobson could not keep himself completely from thinking, what he did think was bitter. *Some few men must always, at any cost, indulge their predilections for fight-*

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ing and hating—even now when so few people are left anywhere. And folks like me, talented or not, are dragged helplessly along, trying to survive . . .

Aware of LaPorte's restless gaze, Hobson wiped his brain clean of distractions, willed it to fullest sensitivity. It registered that in the lush target area, the hundred inhabitants still seemed unaware that twice their number of armed desperadoes were trudging toward them along this once roaring superhighway where grass now grew through cracks in the slab. They were peaceful, up ahead. Optimistic. Hobson wondered briefly if a religious ceremony were in progress; but he received no emanations of exaltation, no unison of feeling. It was just that the average levels of cheer and hope remained high.

LaPorte looked around again. With a pang of nervous self-contempt, Hobson walked faster, to reach the head of the column. He passed between ragged files of men in whom he rarely could detect fears or hopes above the animal level. Men armed with weapons ranging from the carbines of the late lamented United States Army down to pitchforks and butcher knives. Men who wore as their uniform a look of savagery. Men out for booty and women. Men who did not much like Hobson but wanted to have him around and fought to keep him alive—because of the insurance he gave against dreaded ambush. Their heads turned with interest as he hurried forward past them to make his report.

The colonel had left his self-designed insignia of rank well back within the already subjugated territory; less danger, that way, of being assassinated by some countryside lout. He was a fairly large man, bigger than Hobson, with glasses and an habitually mild look. You might take him for a storekeeper or a clerk until you listened to him talk for a while.

As Hobson opened his mouth to report, he felt individual patterns of surprise and alarm coming from up ahead, as if the New American scouts had made contact with local look-outs. When LaPorte heard Hobson's information, the colonel waved his column off the highway to a halt. Within a minute, the scouts' arm-waves from ahead confirmed the contact.

LaPorte thought over what Hobson told him. "Only about a hundred of 'em, hey? All right, we proceed as planned."

Hobson hoped that the locals had a dozen machine-guns and would fight like fanatics. He could tell that many of them were women and children, and he knew what would happen if New America carried the day.

The sound of a shot rose from the island's near edge. "Missed," Hobson muttered. He had felt the

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nearly simultaneous start of three hundred people but no individual shock of pain or impact.

LaPorte now signaled for a cautious advance. Moving forward at the colonel's side, through the scanty cover of some roadside weed-mutation, Hobson walked erect. Lately he was not much afraid of bullets. But he was still afraid of New America. If he tried to betray them, or tried to run away and was caught . . . Hobson trembled, remembering past victims of LaPorte's vengeance.

Perhaps more than he hated LaPorte, Hobson hated himself—abhorred himself for what he had become. This self-loathing was growing every day. Hobson feared that soon it might be strong enough to turn some awful balance inside him.

The attacking formation crept toward the wooded island, moving along the stunted hedgerows and eroded gullies of this once fertile country. A belt of land around the island was normal enough for cultivation. Hobson saw rows of corn sprouting there. A scout crawled back out of the quiet woods to find the colonel. "Looks like they're pulling back, Chief. Wanta go straight on in?"

LaPorte turned to Hobson. "What are they up to?"

Hobson reached for the natives. He could not find the courage to try to save them with a lie; he hoped that somehow they might save themselves. "They're withdrawing, all right . . . but I don't think they mean to run very far. It's funny, they don't seem to expect any fighting, either. It's as if they felt protected in some way."

"They don't mean to fight? Good. Push on, then," the colonel ordered. "Maybe they're some religius nuts." The colonel had once conquered a convent in Wisconsin.

The people ahead did not feel more or less religious than average to Hobson. But he did not comment. For some reason this tiny rebellion of withheld advice only made him hate himself all the more.

If only his kind of "talent," as it was popularly called, could be used to kill! He would get rid of LaPorte and anyone like him within striking distance. Hobson did believe that ultimately evolution might bring psi to effectiveness as a weapon, and maybe in the not too distant future. After all, mutation was sure to continue at a high rate. There was plenty of radiation about, left over from the cataclysmic wars. And the early rays in less than a generation had produced ten thousand persons with acute psi powers for each one such person known before the wars.

The so-called talent had been analyzed to a degree, though science and research were little practiced these days. Something about a sixth sense, something theorized to tuned in on other

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people's brain waves or other electromagnetic emanations. Its efficacy diminished sharply with distance, of course. But it was pretty useful to pick up emotions, on the basis of which predictions of behavior often could be made. Actual thoughts remained difficult to read except as they affected emotional states. A receptor rather than a projecting mechanism, it gave to some talented ones nevertheless the power to slightly move very small objects reposing a few feet away. That phenomenon fortified Hobson's belief that some day the psi talent might develop into a forceful means of defense or offense. So far, nothing of the sort had happened. Hobson felt helpless and hopeless.

The invaders had reached the island. They spread cautiously through its woods. There was no opposition, no sight or sound of the local population. Here and there stretched empty slit trenches and deserted strong points; with a few firearms these people could have put up a good fight. But Hobson sensed they had only moved off deeper among the trees. There they waited, and felt—almost safe.

The village lay well within the island beside a small stream. The huts, mostly of concrete block and banked-up earth, had rifle slits for defense, but they were unmanned. Walks and vegetable gardens filled the spaces among the huts. The locals had built well and tended carefully—but had abandoned everything immediately to the invaders.

A few of the buildings were roofed or doored with sheets of metal, some of which were oddly curved. Acting as a garden fence were enormous blades like those of the rotor of a troop-carrying helicopter.

"Hey, Colonel. Look here!"

A man was pointing at a thin metal door. Peeling paint revealed part of a vast yellow star—the Asiatics' aircraft insignia.

"The damn gooks!" Men looked about them with the alert anger of those who meet respected rivals in new territory.

"It don't figure, Colonel. Our 'copter guys said the people they saw here were white and a few black."

"Maybe the gooks keep'em as slaves."

"Them Asiatics wouldn't build a place like this!"

That last argument, Hobson thought, was convincing. He had seen an Asiatic settlement or two, and they had looked like concentration camps. The huts and gardens of this village showed too much individuality to be under Asiatic authority. But why were they undefended?

LaPorte, with a look of growing concern, was counting helicopter blades. There were enough of them to have carried in a considerable number of the Asiatics. LaPorte

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looked closely at Hobson, who shrugged and shook his head. The people he could sense hiding confidently in the woods seemed not at all like yellow troops.

The colonel set most of his men in a defensive perimeter around the village, then ordered a small crew into the huts to check for booby traps.

The doors were standing open. Inside the huts there were some evidences of hasty departure but little of value had been left in sight. LaPorte temporarily forbade looting; it could be done in an organized way after the locals were definitely taken care of.

"Hey, Colonel, we caught one of 'em! Says he wants to talk to you."

Hobson focused on the thin little man being led into the village between two New Americans. The captive's fear was obvious even to normal senses.

"Wants to talk, does he?" LaPorte looked the prisoner up and down. "Well, I won't mind if he talks."

LaPorte led the way into a hut already searched for booby traps. He relaxed in a chair, his boots among the dishes on a table. Hobson entered reluctantly and took a stand at one side of the single room, hoping desperately that this would be a short and mild interrogation. The heavy window shutters were open, letting in spring air and sunshine.

The prisoner pushed stumbling into the hut by the soldiers was about forty years old, not starved-looking but naturally scrawny. His clothes were not worth stealing. His gaze slid away from Hobson's, fell to the floor before LaPorte's. One big New American, a dedicated sadist, waited in the doorway behind the man.

LaPorte pretended to yawn and stretch. "Where are your people?"

"Off—off there in the woods. H-hiding. They'll come back p-pretty soon. I—I have to talk to you first."

The prisoner was all swamping waves of fear, which was natural enough—or was it? It did not feel to Hobson quite like fear of physical pain. Hobson kept alert for any mass change in the emotional climate outside the hut.

LaPorte made the noise he used for a laugh. "You have to talk? Are you the leader, then?"

"No, no." The little man radiated positive disgust at the suggestion, a negation of ambition as strong as any Hobson had ever detected. "No, they just—sent me to talk. My name's Joe Norwood."

"Well, I'm just delighted, Joe Norwood. Did they send you to talk to the Asiatics when they came here?"

"Yes."

"When you scared off those gooks, which way did they go?" And LaPorte guffawed.

NORWOOD sneaked a look over his shoulder at the bulky, grin-

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ning guard. "Please—look—let me tell what they said to tell, first. Then I'll answer anything I can."

"Who's they?"

I nod over a thin shoulder. "Some—some of the folks back there. They're smarter about things than I am."

"All right. What's this great message?"

"I'm supposed to tell you about—life." Norwood made the word important.

LaPorte's eyes flicked over to Hobson, who made the agreed-upon signal that everything was as it seemed, so far as he could tell. Hobson could nearly always detect the emotional traces of a lie, or the odd and unnamed things that accompanied the use of a psi power.

Norwood spoke quickly, trying to get out his message. "Life as a whole—it spreads out, you know. It tries to fill every bit of space everywhere on Earth. Some—some guys think one reason men have brains is so they can spread life further some day, out to other planets and—and stars and places."

The message had been memorized—in essence, not word for word—and delivery of it was a labor of love. Norwood stood taller as he spoke it.

"Once—let me see—once in England a long time back there was a kind of beetle. Birds were its natural enemy, but it was just the same color as the bark of the trees it lived on. The birds had a hard time seeing it; they couldn't kill off all the beetles, or even most of them."

The colonel was receiving philosophy and beetles with mounting irritation. But with a certain satisfaction, too. Probably he was now convinced that he faced a community of sweet talking religious nuts who had sent this fanatic to convert him.

"But then the factories came," said the fanatic. "And the smoke darkened the trees, and the birds could see the beetles and eat them."

LaPorte said: "So the beetles sent one fruity beetle to talk to the birds. Get to the point, hey?" The guard behind Norwood laughed obsequiously.

Norwood was fearfully determined. "No, no. Some of the beetles, maybe one in a thousand, had always been darker than the others. Now the dark ones matched the bark and the light ones didn't and finally the—uh—the whole species of beetle was dark. Only one in a thousand was light. I'm not telling this right!" Norwood looked around as if for help, clenching his thin hands. "I've got to convince you. They said I might be able to!"

LaPorte now looked like an actor in a comedy doing the slow-burn bit, sitting there with a pasted-on smile. But he was not acting and none of it was comedy to Hobson. He had the sickening thought that

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this was going to be a bad interrogation. Hobson doubted that he could stand to watch it. Soon it would begin, the real questioning: How many men have you? How many guns? Gasoline? Ammunition? Food? Where? And the beating would start, to make sure the answers were right, and just on general principles. What can I do about it, Hobson moaned to himself. Nothing, his rising anger answered; you have no guts to do anything, you miserable, crawling . . .

"What happened to the Asiatics, you obscenity?" LaPorte was smiling. Hobson could smell the cesspool boiling up behind that happy face.

Norwood closed his eyes for a moment, radiating fear to Hobson, but also determination and a tremulous anger. "The yellow soldiers came here and said we'd have to obey them. Right at the start they hurt some of us, for no reason at all . . . Let me try to say it this way. Life defends itself, see? Every way it can. Every kind of animal has some defense against its natural enemies. A man has no natural enemy except other men, the brains of other men. But now some men are a danger to all of life!"

Sudden suspicion flared in the colonel's mind; his boots thumped to the floor. "Can you read emotions?" he barked. "Predict reactions? Raise fires?" He ran quickly through the short list of known psi talents. "Can anybody here do these things?"

"No, no." Norwood shook his head. He glanced over at Hobson and seemed about to smile, as if finally guessing Hobson's function.

Now Hobson, in his increasing shame and self-disgust, would have dared to lie to LaPorte. But he could think of no lie that would help Norwood or his people. Hobson signaled honestly that the prisoner was telling the truth.

LaPorte leaned forward in his chair. "Now this is your last chance to stay in one piece, mister. Talk straight and tell me where the gooks went. We know they were here."

Tell him, tell him, pleaded Hobson in his own mind. If this turns into a bad interrogation, I won't be able to stand by. I'll go wild and get myself killed.

NORWOOD, cringing but still determined, recited memorized words like a last desperate incantation against evil. "You have to listen! Life defends itself against the power of one human brain by using another human brain. Life doesn't care about individuals—it feeds on itself all the time anyway. Uh—a feedback set-up—"

LaPorte's anger passed critical mass. But as he opened his mouth to speak there came a cry from outside the hut. The cry of a woman in pain or trouble: "Joe, Joe!"

The dominant emotions out there

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were not those of an attacking force, which Hobson would have noticed sooner, but an intense interlocked web of fear and lust, hate and guilt, emanating from a handful of people.

Norwood spun around to face the open doorway of the hut. The massive guard blocked his way like a stone column, grinning, pushing a pistol barrel up under Norwood's chin. But the little man, and Hobson, could see past the guard to the outside. There a young woman struggled in the grip of two soldiers who were dragging her into the village. Again she cried out: "Joe!"

"My wife," whispered Norwood. He broadcast despair, and rising fury.

"Watch what comes next," grunted LaPorte, his good cheer returning.

Hobson knew suddenly, with a detached wonder at his own final courage, that he had had it, that he was casting his own small vote here and now against the New Third Reich. His fingers closed on his pistol. His gaze was on the middle button of Colonel LaPorte's jacket.

But from the corner of his eye, Hobson saw Norwood reaching up for the guard's gun. Hobson hesitated, thinking: shoot the guard first, he has his gun drawn . . . then shoot LaPorte . . . then remember to save one bullet.

Norwood hardly looked capable of making a quick forceful grab and he was not attempting one, just reaching up his hand . . .

. . . and time stood still for Hobson as something new to him came in a great wave against his extra sense, something he could compare to the psi he knew only as the ocean tide might be compared to the wake of a motorboat. Hobson stood frozen, his gun half drawn, watching the brawny guard topple stiffly backward, relaxing his grip on his weapon as Norwood's fingers closed on it.

Hobson thought the fabric of the universe was tearing apart. He could only wait like an awed child, vaguely aware of Norwood ignoring him, ignoring LaPorte, Norwood fumbling inexpertly with the gun and stalked out of the hut, his small chin jutting in anger. Men's voices began to yell outside the hut, first near, then far away. There were no shots, no sounds of fighting.

The tide of—something—receded slowly from Hobson's perception. The fabric of the universe was stable and familiar once more. The sun shone brightly through the open windows of the hut. A fly cruised in, then unconcernedly left through the doorway.

Everything was quiet. Even LaPorte. Any awareness of the colonel had been blasted from Hobson's consciousness by the awesome feat he had witnessed, but now he forced himself to turn.

LaPorte lay back dead in his chair, apparently unwounded, eyes

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wide, mouth slack, the pasted smile gone with everything that had been behind it. His right hand was clutching at his gun holster.

The quiet was profound. Staring at the dead figure, Hobson tried to comprehend. His extra sense was still numbed by whatever had happened, as his eyes might have been dazzled by glaring light. He could not tell what was going on outside.

He found that, for the moment at least, he did not much care. He finally finished drawing his pistol, looked at it, then dropped it back into the holster. He walked out slowly into the sun, stepping over the motionless legs of the fallen guard.

There were dead New Americans scattered everywhere, quite a number of them. Joe Norwood stood a few yards from the hut, his arms around his wife, his face on her shoulder, the gun hanging in his hand as if forgotten.

"Joe, it was my fault, not yours," the woman was saying in low, comforting tones. "I wanted to stay near you. But I wasn't careful enough, and they found me . . . it's all right, Joe. It was their own fault." She noticed Hobson as he walked slowly toward them. She fell silent a moment, then went on consoling. "A lot of them ran away, Joe. And here's one who didn't mean you any harm. He can join us now."

Norwood looked around and Hobson saw tears in his eyes. Hobson stood there waiting, not really expecting to go on living from one moment to the next.

"I wanted to explain things," said Norwood, staring into space. "I just came right out and *told* the yellow soldiers, but they didn't believe me. This time I tried to go slow, give the whole picture, but it didn't help. If only I could talk better. If only I could explain!"

"Explain about—you?" Hobson asked. Suddenly it came to him that he was beginning to understand. He felt tired and shaky, now that it seemed he might be going on living.

Norwood spoke in a dry whisper. "Anyone who decides to do something that will hurt me, dies. Dies right there and then." He looked at Hobson. "When I was a boy, I saw another kid draw back his arm to throw an icy snowball." He screamed at Hobson suddenly, "When I was five, my father tried to spank me!"

"Hush, Joe. Hush. It's all right now."

Norwood's eyes wandered again. "I would have killed myself before now, I think. But the war came. A lot of people have died, trying to hurt me . . . so now I think I do some good. I hope to God I do some good."

The woman stroked him. "You do, Joe. You keep us all safe."

Hobson looked up at the bright blue sky of Earth, and saw in it a kind of hope. ★

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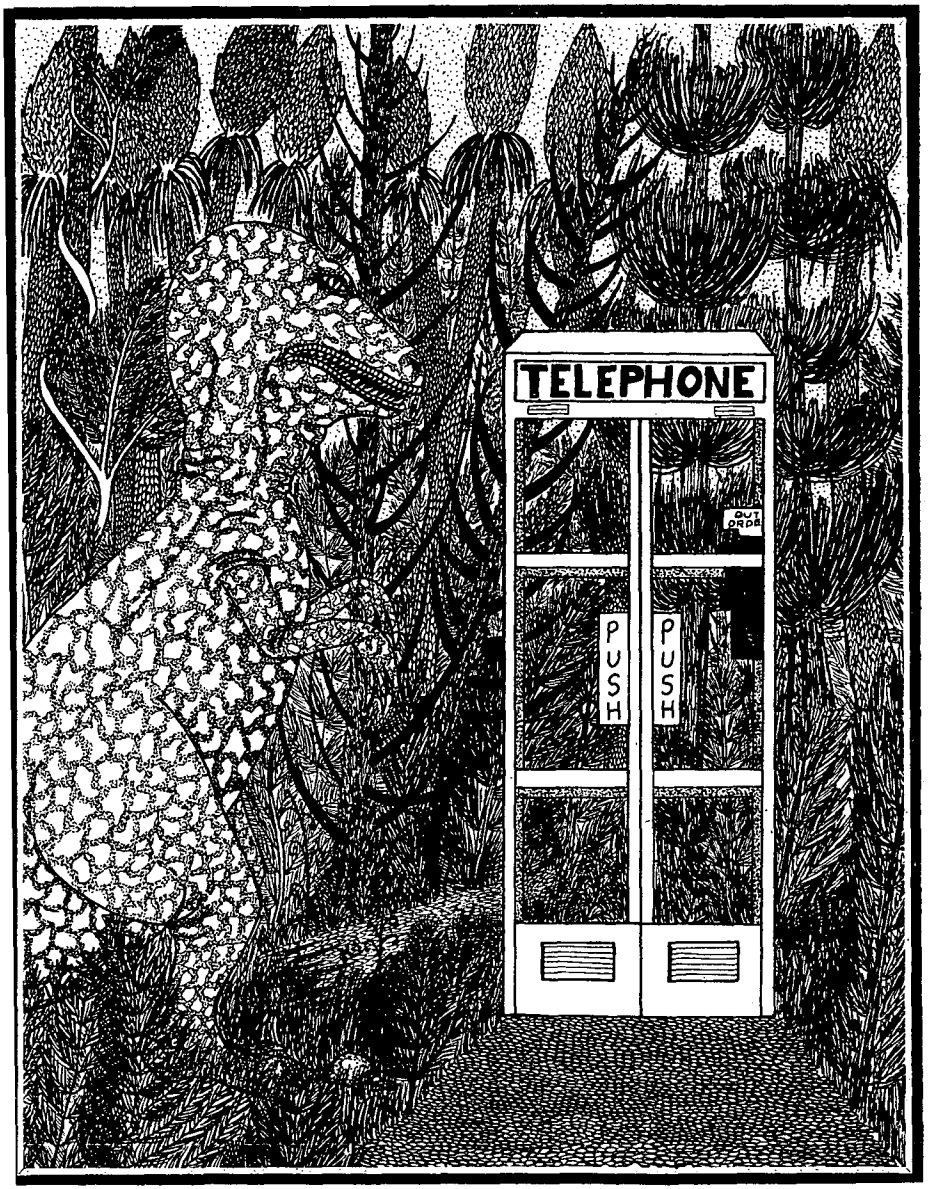

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SCIENCE FACT

JERRY POURNELLE, Ph.D.

A STEP FARTHER OUT

THIS GENERATION OF WONDER

THE annual meetings of the American Association for the Advancement of Science are always exhausting affairs, but the 1974 meeting in San Francisco was particularly nerve racking. To begin with, the Triple-A.S. filled every meeting room in three large hotels. At every session, morning and afternoon for a week, I was faced with the problem of choosing just one from a menu of panels that included: the energy crisis; report by the Skylab scientist-astronauts, with Werner von Braun as an added attraction; Dr. Immanual Velikovsky presenting his theories for critical discussion by Big Science after 20 years of rejection; reports on the agricultural revolution; Carl Sagan, James Van Allan, and Bruce Murray on the new portraits of the planets; ecology and pollution; exo-biology and the Viking Project; past and future efforts to detect signals from extra-terrestrial intelligences; fusion power; alternatives to fusion power; Remo Ruffini, Robert Kraft, and Stirling Colgate on super-novae and collapsed objects; and on, and on, and on.

To make the decisions harder, I was invited to press conferences where we could discuss the new findings with the panelists—but the press meetings went on at the same time as other presentations. How do you decide whether (1) to get involved in an argument between Rusty Schweikert and the Skylab astronauts on one side, and the devotees of black box space exploration on the other, or (2) to attend Bruce Murray's lecture on Venus seen from Mariner?

During the week I stayed with Poul and Karen Anderson, which was probably a mistake. The mistake wasn't that they live on the other side of the Bay and so we had to get up at 6:15 every morning lest we miss something important beginning at 8:00. No, the problem

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was far worse—after hearing those panels, how could we get to bed at a decent hour? We *had* to sit up all night in discussion.

After all, we saw most of what we thought we knew—and many of our hard-science stories—go crashing down in flames. It's a brand new universe, one we're only barely acquainted with.

BEFORE someone gets the wrong idea, it wasn't Velikovsky who brought down our comfortable universe and solar system. The Velikovsky panels were strangely disappointing. To begin with they were more like debates than scientific discussions. Dr. Velikovsky even had a cheering section whose applause probably embarrassed him.

The majority of those attending the Velikovsky sessions seem to have come away with mixed feelings. Most scientists now believe Velikovsky is neither crank nor crackpot, but they still think he is most wrong. His views and their treatment by Carl Sagan and others is worth a column, but this isn't it. For now, it's enough to say he didn't concede an inch, and he left with few converts.

No, our understanding of the universe is changing more rapidly now than at any time in human history because this is the first generation to have the equipment to obtain the necessary information. Consider the planets as an example.

As Carl Sagan put it during the meeting, "Not very long ago planetary astronomers were safe. We could make any speculation we liked and never be found out, and there were plenty of surprising speculations. I made some of them." (In his book with Shklovskii, *Intelligent Life in the Universe*, Dell, 1964, Dr. Sagan argued that the moons of Mars might be artificial satellites.)

"Now the spacecraft hang like swords of Damocles over the heads of the astronomers, and you can see on their faces a strange amalgum of fear and hope as the probes approach their destinations. In this decade the boundaries of realism have been pushed back. It is a decade of wonder."

He went on to prove it by demolishing our previous models of the planets. Science fiction readers are getting used to the "new Mars" and "new Venus", but even those change with every analysis of the Mariner data. And Mars and Venus aren't the only casualties of the spacecraft. It is now seriously thought that the Moon may have been formed inside the orbit of Mercury, although no theory has yet been advanced to explain how it got out here to be captured by Earth.

THEN Poul Anderson and I watched Jupiter come crashing down with nearly every science fiction story about the giant planet as

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James Van Allen told of the results of Pioneer 10's encounter. To start with, it doesn't seem we'll be using the Galillean moons as fueling bases for ships, or for colonies as I suggested two columns ago. You can't get to them—at least not alive.

Out to Callisto and beyond, the radiation belts around Jupiter are so intense that it will take many feet of shielding for man to survive. Unless someone invents a space-drive several orders of magnitude better than any we have on the drawing board the weight penalty of shielding makes it inconceivable that we can fly men anywhere near Jupiter. Dr. Van Allen estimated 30 planetary radii as the closest safe distance.

Goodbye to "Call me Joe," and "Meeting with Medusa", and a host of other favorites old and new. And yet—the fusion scientists are very hopeful now. Perhaps a new kind of space drive is closer than we think. [*See the August issue of* Worlds of If *for Dr. Robert Ensman's science-fact article, "Torchships—Now!" Ed.*]

There was more to the planetary sessions. On July 4, 1976, the first Viking probes will land on Mars. They contain an ingenious system for testing and detecting life on Mars, if there is any there. The sites chosen for the Vikings, by the way, correspond to the middle of the Atlantic Ocean, the Gulf of Tonkin, and the entrance to Yellowstone National Park—would Martian probes arriving at those points find life on Earth?

But think about that date. About two years from the time this magazine is on the stands. Ten years ago the top planetary scientists could seriously wonder if Phobos and Diemos were artificial, and the Grand Canal more than a poetic image. Two years from now, we'll have data about Martian life. Not guesses, hard data.

As I write this, the Mariner probe has rounded Venus and is on its way to Mercury. As of now,we know almost nothing about Mercury. I have just finished a story about an expedition to Mercury and don't dare send it to my agent because by the time this article is printed the probe will have arrived. In the short time between my writing this and your reading it we will have learned more about Mercury than during the entire sweep of human history.

Meanwhile, Pioneer 11 is on its way to Jupiter for our second look, arriving this December—and after it passes it will probably be headed for Saturn. By 1979 we'll have our first close look at the ringed planet and its giant moon Titan. A few years ago we knew nothing about the rings. Now we've bounced radar off them, to find that they're not all dust at all, but have chunks several meters in diameter within them. In five more years we'll have a close look.

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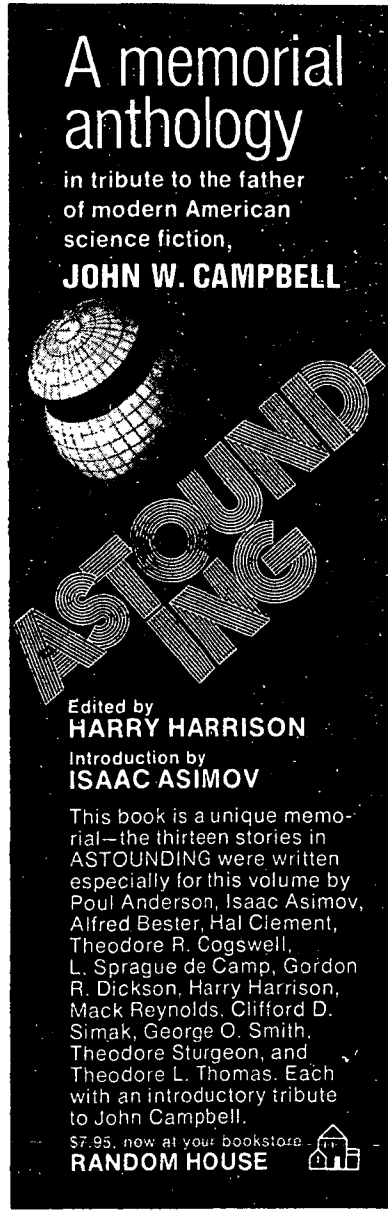
In 1987 we can have a close look at Uranus. The technology to send a probe there already exists.

In other words, the information curve has never been steeper. In the past decade we may have learned as much about ourselves and our universe as mankind learned in the previous three million years that we've been around. Even that time span changes like dreams—the first lecture we attended at the AAAS meeting was a presentation by Richard Leaky, Director of the Kenya National Museum. Leaky believes he has a skull, #1470, that dates *genus homo* to three million years ago. This published date has been disputed, but during his lecture Leaky announced a new find, 1805. He stated that "If 1407 bothers you, 1805 will horrify you."

Paleontology and space science, biology and physics, in every field we are learning faster than the publishers can get their textbooks revised.

Take earth sciences, for example. We've only begun to examine the Skylab data. There are thousands of photographs and instrument readings that no one has even looked at, much less analyzed. For the first time we have a real-time history of a solar flare, because the astronauts were able to point their cameras and instruments at it. As one astronomer pointed out, that one little splash-up, a minor thing and quite common on the Sun, produced enough energy to run the US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economy at present rates for a million years.

The fusion scientists called their panel "Imitating the Sun."

FOUR years ago I wrote an article on the coming energy crisis in the United States. As part of the research I visited the best known fusion research laboratories and asked what they would do with more money. They really had no good answers.

No longer. Now they can do three times as much profitable research, because now they know at least twice as much about fusion as they did four years ago.

What else should we look at? Returning to Skylab, it wasn't only the solar scientists who were excited. Earth resources and earth sciences took a quantum jump from Skylab, and may take another when the unexamined data brought back is analysed. The materials-research people were ready to do handsprings over the crystal growths obtained in the space environment. Ultra-pure materials, thin film development, biologically produced substances—there were surprises in every experiment, and all were exciting. I asked Dr. Harry Gatos, the MIT metallurgist in charge of materials research conducted by Skylab, if among the as yet unanalysed data there might lurk something as significant for everyday society as was the discovery of the transistor.

"I can't rule that out," he said. He was trying to be cautious, but it wasn't possible. "I'm certain that space materials-research can be as fundamentally important as any discovery in history."

Is it any wonder that the Andersons and I were unable to knock off for sleep at night? Every one of these developments deserves an article as long as this one. I apologize to the readers for this grasshopper presentation, and I only hope I can convey a small part of the excitement going on in scientific circles.

It's not only the discoveries we've just made. Nearly everywhere was the feeling that the best is yet to come—and we'll live to see it.

Consider collapsed objects in space, and particularly the black hole. Black holes are theoretically possible in Newtonian physics, but they were first described as a theoretical anomoly lurking in Einstein's General Relativity. No one paid much attention to them.

However, back in the thirties Fritz Zwicky of Cal Tech's Mount Wilson organized a search for supernovae, and argued for their importance in understanding the universe. In the forties J. Robert Oppenheimer did some basic theoretical work on black holes and neutron stars, and there began to be a feeling that such things might exist.

Unfortunately, there wasn't any

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way to locate them, or to study them if someone told you where they might be. Radio astronomy didn't exist. X-ray astronomy, which requires instruments in space above the earth's atmosphere, was not even possible.

Then, in 1968, British radio-astronomers discovered something entirely unsuspected, something absolutely new; the pulsars. These incredible objects emit a brief but very intense burst of radio energy at precise intervals on the order of a second. No one knew what they were and as late as 1971 Robert C. Haynes's, in his excellent survey of the space sciences, found no concensus among astronomers. They might, he said, be any of a half dozen things—or even something unknown.

In San Francisco last week there wasn't anyone who wasn't sure that pulsars are neutron stars. There was even agreement on how they are born. This too is worth a complete article. The point is that the conference was organized by Fritz Zwicky, and although he died two weeks before the meeting, he had lived to see the whole story from supernova to black hole known and understood.

ONCE again, it is not because this generation is more intelligent than past ones. We only have better tools to work with. We have computers to analyze incredible quantities of data. We have instruments which will detect the almost infinitesimal slowing down of the pulsars, one of the crucial facts indicating that they are very probably neutron stars.

There was more, however, Ten years ago; black holes were a theoretical construct attracting attention but not taken very seriously. Now most astronomers are agreed that we are actually observing one.

Well, by definition you can't observe a black hole, because the escape velocity from the hole is greater than the speed of light. No signal or information can come out of the hole. But we can observe the hole's effects on a companion, and that's what is happening right now. Many astronomers are convinced that Cygnus X-1 is a binary with a black hole component.

Ten years ago the holes were pure theory. Now, Remo Ruffini of Princeton can seriously announce that he believes there are hundreds of millions of them in our own galaxy alone. Moreover, we may be detecting energy from the amount of collapse. We may be witnessing the deaths of stars.

Many of our key observations are accidental. When Congress ratified the Treaty of Moscow, which bans nuclear tests in the atmosphere and in space, a condition was attached. The United States must unilaterally be able to detect any space weapons test. This brought about the practi-

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cal birth of x-ray astronomy, and even now the data comes in like quotations on the stock market ticker.

To detect weapons tests we launched the Vela satellites. These search for x-ray events in space, and record the time and source of x-ray bursts lasting longer than a second or so. They hadn't been up long when they began to chatter. Something out there was putting out bursts of x-ray energy, and a lot of it.

It didn't take long to decide they couldn't possibly be nuclear tests. From Vela's inception we have observed about half a dozen significant x-ray events each year. They are scattered throughout the sky, so that it is certain they are comparatively close—tens to hundreds of lightyears, no more. Were they farther away, thousands of parsecs, they would cluster around the ecliptic, and they don't.

That many events in such a comparatively small volume of space means that in the galaxy as a whole there are an incredible number. The bursts are short, and they come on and go off abruptly. Ruffini believes they may be the result of the very moment of collapse, the instant at which a white dwarf falls inward to become a neutron star or black hole.

Meanwhile, both here and in Europe, incredibly sensitive gravity wave detectors are under construction. It will not be long before we can compare the timing of the x-ray events with the arrival of gravity waves. Once again we are about to learn at least as much as we know; another doubling of knowledge.

A GENERATION of wonder. It is a unique generation, as many of the panelists pointed out. Fifty years ago—even ten years ago—we couldn't study the basic structure of the universe because we hadn't the tools. We could not answer even the simplest questions about the solar system; we couldn't get out there.

Fifty years from now we won't be able to study the basics because they will already be known. Our grandchildren will learn in grade school what it will be our privilege to discover. The information curve may never be steeper than it is now.

Next year the AAAS meeting will be in New York. It promises to be as exciting as this year's, with an added bonus. One of my frantic meetings in San Francisco was with AAAS officials. The topic was sf-writer participation in the New York meeting. [*Jerry is this year's President of Science Fiction Writers of America. Ed.*] The information flow to science has become so great that no one understands what it all means—not just what it means for science, but what it means for all of us. Perhaps science fiction writers can help.

I probably won't get any sleep that week. ✱

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ACT OF MERCY

Reality wears many faces,
some beautiful, some grim.
If only we could choose!

STEVEN UTLEY

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HER husband Howard and wife Karen were snoring softly on the couch when she came in. They had been watching a hologram when they fell asleep. Dianne smiled when she saw them and quietly crossed the cabin to switch off the set. The cassette had played itself through, and now the set offered only a strange view through a ragged-edged hole into a darkness against which stars spun and swirled lazily. Dianne frowned abruptly at odd stabs of agony in her abdomen, and then, as the pain worsened, she clutched the holograph console and sagged against it for support. And closed her eyes.

She woke up very slowly, a little at a time, and found herself looking up through a large and jagged hole in the ceiling of the airlock. Through the hole, she could see utter blackness shot with pinpoints of utter brightness. The universe seemed to pass in review as she spun with the ruptured hulk of Compartment F. She felt again the horror gnawing at what was left of her guts. She opened her mouth to scream but it hurt her too much. A roaring noise filled her ears. Blood engorged her eyes, making the pinpoints of utter brightness glow a sickly red as they moved past the hole. Within the shell of her life-rig, she felt minute stings as hypodermic needles automatically slid into her flesh.

Dianne Drake forced herself to subside and listened to the harsh sound of her own ragged breathing while waiting for the drugs to take effect, to make the pain and fear go away. She had not been dreaming about the hole and the stars. She was not with her wife and husband. She was not aboard the Wheel now. There was no Wheel anymore. Something had happened to it—she didn't know what and doubted that she would ever know.

She had not been dreaming about the pain, either, because something had happened to her, too. She and the heavy-maintenance robot had just re-entered the Compartment F airlock when the deck suddenly buckled underfoot, flinging her against a bulkhead. The massive robot had grazed her across the abdomen, caving in but not puncturing her shell, as it was heaved past her and flipped out through the open airlock hatch.

She had been hurt, hurt badly, she knew that, and she was dying here in the dead hulk of Compartment F, wreckage within wreckage, she knew that too. *Oh God please don't let me die* here *don't let me die* alone—

No. Not alone.

A-26 moved into her field of vision and lowered itself to its knees beside her, like a giant, quicksilver-colored mantis descending upon its prey. Dianne had always felt uneasy in the presence of cyborgs, but she nonetheless gave A-26 a faint smile and gestured beckoningly.

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The cyborg moved its good hand over her lightly, almost tenderly, testing the thin straps that bound her to the deck. A-26's other hand dangled forlornly at the end of a tangle of thin cables and hair-fine wiring. The plastic forearm, shattered during the Wheel's break-up, looked like an exploded timepiece, all disarrayed springs and wires.

"I thought you had expired, Ms. Drake," said A-26's inflectionless voice in her helmetphones. "You've been unconscious for several hours."

"Just . . . resting my eyes." She tried to laugh. The effort was too great. The pain under her ribs stabbed too deeply. She bit into her lip, forcing herself to be still and, when the pain had receded somewhat, she said very softly, "Are there . . . did you find others?"

"No, Ms. Drake. Most of Compartment F seems to have twisted away with Compartment E. It's unlikely that anyone in this section had time to get into a life-rig. I did not find the remains of an unidentifiable human being in the EVA monitoring room—"

Poor George, Dianne thought, closing her eyes, shutting out the soft, maddening swirl of lights beyond the hole, *poor George.*

"—and," the cyborg went on, "the wreckage of A-20 in the life-rig maintenance room. Everyone and everything else is gone. Compartment G broke away cleanly, so it's quite possible that it managed to seal itself in time."

Possible, Dianne reflected dully, but not too probable. It was also possible that G had ruptured, that Howard and Karen were dead, blown up in their sleep. If only the maintenance robot had not taken so long to set the plates for her, if only she could have finished her EVA work on schedule, if only she could have gotten back inside when she should have, she would not be here. She and Howard and Karen would have all gone on sleep-shift together, she would not be here, she would be with her husband and wife, not here, not alone, God God oh God it hurt it hurt—

She pounded on the deck with her fists, strained against the straps, causing herself worse agony. She screamed until the pain in her emptied lungs was greater than the pain in her bruised abdomen, and then, as the needles again began to slide into her, she almost expired from a coughing fit as she tried to suck air back down into her chest.

"I'm sorry that there's nothing I can do," A-26 said tonelessly, just before Dianne blacked out again.

KAREN'S hands, surgeon's hands, sure, steady hands, cupped Dianne's face tenderly. They kissed each other passionately, and then Karen suddenly jerked away in the darkness with a yelp of surprise. Howard had bitten her on the thigh. A pillow fight ensued between Karen and Howard.

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Dianne, caught in the middle of the bed, lay convulsed with laughter between the combatants.

Finally, when the last pillow had been sent flying across the cabin, Howard and Karen stretched out on either side of their new wife.

"Welcome to the marriage," Howard said, kissing Dianne on the cheek. "Now that you're in our power, we shall have our way with you, my dear."

"Just as long as you don't bite me on the leg," Dianne said, hugging his neck. Karen snorted. And then legs and arms became entwined, and hands touched things in the darkness, and then the cabin became suffused with the light of thousands of stars.

"Two-Six?" Dianne called, resignedly letting dull pain pull her out of sleep, out of the dream.

"Ms. Drake, how do you feel?"

"Like . . . pulped meat. I *am* pulped meat."

"You mustn't despair. Help will come soon. Some sections of the Wheel were surely able to seal themselves. A help-call was undoubtedly transmitted within minutes of the break-up."

Dianne opened her eyes and, pointedly avoiding the slow swirl of lights beyond the hole, looked at A-26. The cyborg had strapped itself to a stanchion and seemed to be sorting through the tangle of wires and cables sprouting from the plastic upper arm. She tried to speak again but produced only a dry hiss in the back of her throat. She moved her head weakly, groping with her mouth for the water nipple in her helmet. When she finally found it, she sucked gratefully, noisily, for several seconds.

"How long," she managed to gasp, "since the accident?"

"Approximately thirteen hours, Ms. Drake."

"Any sign of . . . rescue? Anything?"

"Not yet."

Dianne turned her head slightly and saw the two plastic halves of a replacement forearm pinned to the deck by the cyborg's foot. "Is there any . . . point in repairing yourself, Two-Six?"

"I am programed for self-maintenance."

"Robots are . . . programed, Two-Six."

"I have directives, Ms. Drake."

"Aren't you at all . . . afraid of . . . dying again?"

"The question has no meaning for me. Please rest now. Conserve your strength."

"Do you . . . what was it like the first time . . . you died?"

"I don't remember. Please rest."

"Two-Six, I'm afraid to d--" Dianne broke off in terror. She knew that she was dying, that the careening heavy-maintenance robot's almost casual blow had mushed her insides to jelly, but she could not bring herself to *speak* of her own death. She tried to imagine oblivion. She tried to imagine Howard

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and Karen living on without her. She could not envision death as being much different from space, only without all of the stars, without any stars at all, just blackness and vastness and tumbling forever into that infinite and unrelieved darkness, and the pain was rising in her again, and she wondered if, in dying, in becoming dead, she would carry the memory of so much agony with her as she started to tumble and God God *God!*

If only it did not hurt so much.

If only Karen and Howard were with her.

If only the heavy-maintenance robot had struck her squarely, caved her in completely, killed her instantly.

If only she had gone on sleep-shift with her wife and husband.

If only dying did not take so long.

If only she were not cut off from her loved ones.

If only it did not hurt so much.

"Two-Six."

"Yes, Ms. Drake?"

Dianne hesitated, gathering her courage, and sought the water nipple. She got a small mouthful of water before her supply gave out with a soft, sucking noise. She held the cool water in her mouth for a long time before swallowing.

"I want you to help me," she finally said, fumbling at her belt for her spot-welding pistol. She did not have the strength to detach it once she had located it. "Two-Six, take the gun . . . adjust beam for maximum intensity . . . point-blank at my helmet . . . death should be instantaneous . . . and painless."

"Ms. Drake, I cannot do what you ask."

"Oh, oh God, *please!*"

"My programing forbids the taking of human life, whether through action or inaction."

"You were human once!" Dianne cried out, feebly vehement. "Don't quote manuals at me . . . please, please understand . . . I'm *dying.* I'm already dead . . . *I'm in pain, damn you!*"

"Help will come," A-26 flatly insisted. "You must have hope."

Hope? She was too weak to hurl the word back at the cyborg. *Hope of what? Hope of what?*

Hope of rescue. But the Wheel had broken up. Compartment F was tumbling through space, an inert shell, with one chance in a million of being sighted and investigated by any rescue ship—presuming, of course, that there even was a rescue ship.

Hope of reunion. But Howard and Karen might already be dead, and even if they still lived, even if Dianne were found, even then, could a three-way marriage function as such with an incapacitated member?

Hope of living. But she was dying.

Hope of dying. But she was dying in agony.

Hope of sleep. She slept.

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THEY looked at her messed-up body and shook their heads sadly and began to shave her head. Dianne knew what was happening and tried to push them away, but there were straps binding her to the table, holding her still. She screeched with horror as they began to remove the top of her cranium, and then she stopped screeching, because they had severed her from her body, they were carefully lifting out the essence of Dianne Drake, drawing the brain and spinal column out of the useless body. They did things to the essence of Dianne Drake. They built a mantis-like body of metal and plastic in which to house the altered essence of Dianne Drake. They activated the mantis-like body, and all that remained of Dianne Drake, the special knowledge, special skills, special usefulness, was as one with the self-winding, self-propelled body.

They gave the body an identity number and put it aboard a Wheel, where it worked in Hydroponics under the supervision of a human being named Howard Drake. Where it worked in Surgery under the supervision of a human being named Karen Drake. Where it did not know and was not known.

Where it was worse than dead . . .

Where it was alive and cut off from the living.

Dianne's throat was on fire when she woke up, but there was no more water. There was no hole in the ceiling, and no swirl of stars. There was no pain.

There was light. There were muted voices all around her.

"Two . . . Six?" she hissed, barely audible. The light hurt her eyes, and she could not understand what the soft voices were saying. "Two-Six . . . where am I? Two . . ."

She blinked frantically, trying to focus her eyes and, suddenly, the light was gone, the voices were gone, the jagged hole was above her once more, but so, too, were people in life-rigs. She was in pain now, writhing on the deck, unrestrained by straps, and there was a noise in her helmetphones, *everything all right everything is all right everything is going to be all right,* and then she was alone again, bound to the deck of the airlock in Compartment F, and then she was not alone, she was with Howard and Karen, the three of them huddled together in their Compartment G cabin, pleasantly tired after workshift and very much in love with one another, and then, and then . . .

Dianne let go of the images, blinked them away, and saw that it was very bright in the operating room. For just an instant, she imagined that the source of illumination was a very large and jagged hole in the ceiling through which the stars poured their light. The notion fled immediately, but she nevertheless frowned with thought, groggily aware of a wrongness about the presence of such a hole in

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an operating room. She shoved the whole matter from her mind when she saw Karen standing beside her.

"Oh God," Dianne croaked, crying. "Oh God. Oh God."

Karen leaned over to embrace her gently. "It's okay now," she murmured soothingly. "It's okay. Everything is going to be okay."

"I . . . so afraid, so afraid . . . Howard?"

"He's safe, we're all together again, honey, everything is—"

"Where is . . . he?"

"Soon." Karen kissed Dianne on the mouth and drew away. "He'll be here soon. Sleep now."

"Karen . . . I don't want it to be a dream."

"It's real. Everything is going to be all right. Sleep. Sleep."

She slept or awoke—she could not be certain, because Karen and the bright operating room went away, and the pain returned, and the stars spun past the hole above her, and A-26 tinkered with its shattered arm, and they were shaving her head again, cutting off the top of her skull again . . .

No!"

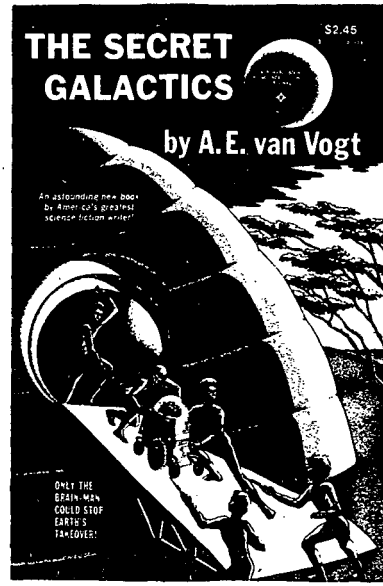
"Easy," murmured Howard. "Easy."

"I'm afraid, Howard," Dianne whispered. "If I open my eyes, you'll go away."

"I'm here," he said. She could feel his breath on her cheek.

"Where am I?"

"You're aboard the Wheel, what's left of it anyway, and I'm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here. Karen's here, and we're going to take . . . good care of you."

"You're crying, Howard." She slitted her eyelids, mindful of the light, and regarded him sadly. His eyes were wet and red. "I don't want to die. I don't want to leave you and Karen."

"We don't want you to leave."

"I'm scared, Howard. Don't let them—"

He silenced her with a kiss. "Everything is going to be okay."

"Everything," affirmed Karen as she loomed over Dianne. Karen was wearing her surgeon's gown and cap now. "You'd better leave now, Howard."

"I'll stay," Howard said. "She's my wife, too, Karen."

Karen nodded slowly and looked down at Dianne, who lay upon the table between her spouses, groping for the memory of another time when she had lain thus. Karen touched Dianne's face with one of her sure, steady hands and said, "I love you," and Dianne felt her surgeon-wife's fingers trembling against her skin.

"I love you both," she murmured softly, *good-bye, I love you,* and then Howard and Karen were gone, their faces replaced by those of strangers. Dianne blinked, startled by the change, and the hole was above her once more, the stars were sweeping past as Compartment-F tumbled through space. She was alone with A-26 again, in pain again.

Strangers?

She bore her agony in silence as she tried to separate products of imagination from realities. She conjured up images of Howard and Karen, of a scalpel trembling in Karen's hand, and she took heart. There were no strangers. Howard and Karen lived. They were her hope of salvation, they knew what she would want, they would not let her down . . .

She lay waiting for an act of mercy, for a final gesture of love, and she kept telling herself, *Everything is going to be all right, everything is going to be all right,* even as she slid into other dreams, other times. *Awake or dreaming, everything is going to be all right.*

She lay waiting.

She lay dreaming.

IT AWOKE.

It found itself on a table in a brightly illuminated room. It felt confusion for a moment as she clutched at memories of dreams, and it sensed within herself a terrible, bitter loneliness, a vague awareness of having been somehow betrayed. It could not account for her feelings, and it was further surprised to feel grateful when, finally, she let it sit up. Promising itself a psych-check at the first available opportunity, it stepped down from the table rather like a mantis moving from leaf to leaf.

No dreams, it dutifully reminded itself, *are good dreams.* ✦

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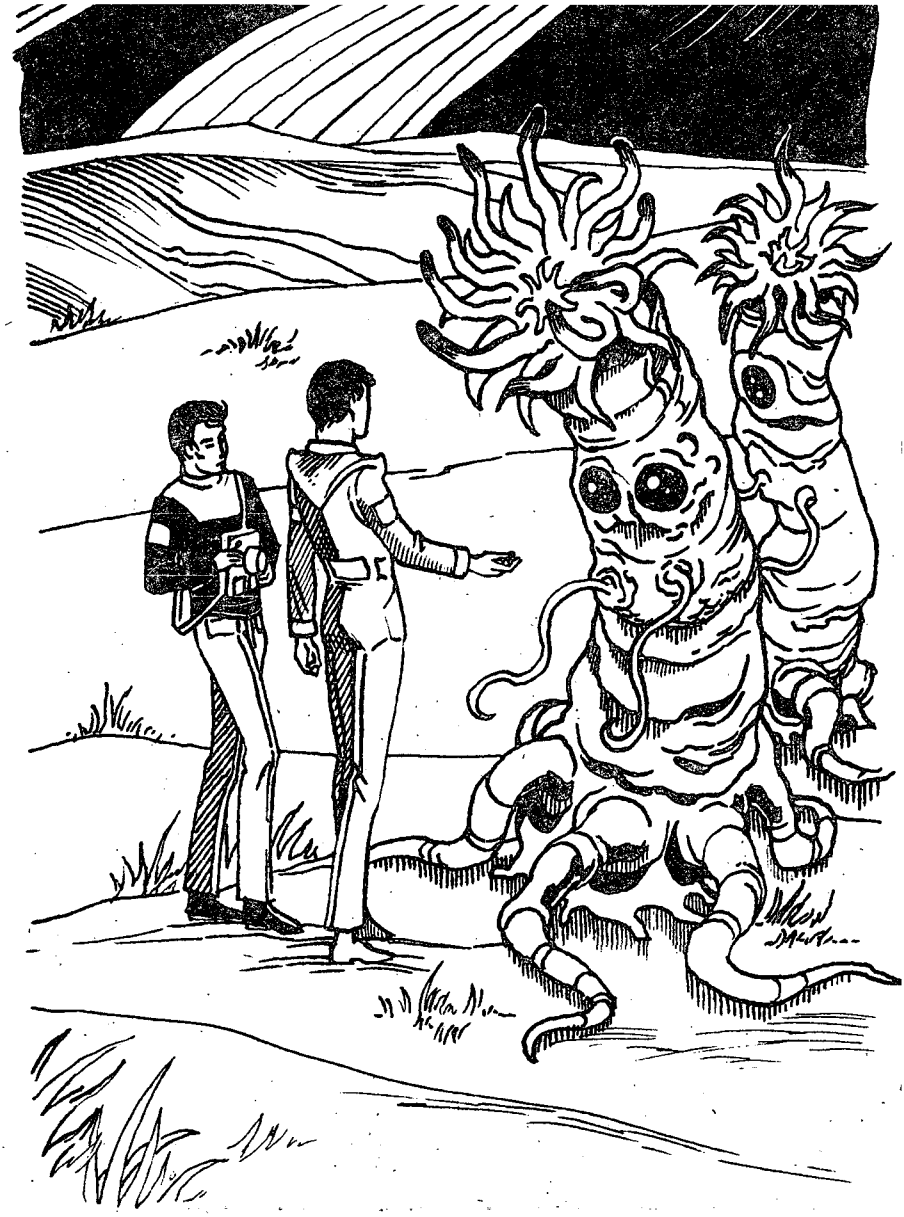

Part II of III

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WHAT HAS GONE BEFORE

In the 24th Century mankind has developed interstellar travel and is tackling the huge task of siphoning off Earth's excess population. Unfortunately, only one other habitable planet, Terranova, has been discovered, and an economic brake has been placed on the flow of settlers to it by making the journey highly expensive. This policy was introduced and enforced by the vast Starflight Corporation which controls all manufacture and operation of spacecraft. Most of the Starflight fleet is engaged in the transportation of settlers, but it has a separate Stellar Exploration Arm which continues with the search for habitable new worlds. The President of Starflight Corp. is ELIZABETH LINDSTROM, *the richest and most powerful human ever. She has been debased and corrupted by her power to the extent where—like sultans of old—she has been known to kill employes for minor transgressions.*

VANCE GARAMOND, *captain of the exploration ship* Bissendorf, *was about to leave Earth on a year-long mission and was summoned to Elizabeth's headquarters for a preflight audience. While waiting impatiently for his interview he was entrusted with the job of looking after Elizabeth's small son,* Harald. *Garamond, who was becoming disenchanted with the fruitless search for other planets, was too busy with his own thoughts to notice Harald climbing up a tall statue. Before Garamond could prevent the accident, the boy fell and was killed. Garamond knew at once that not only was he doomed, but that the President's psychosis would prompt her to wreak vengeance on his wife,* AILEEN, *and his own son,* CHRISTOPHER.

He discovered, however, that the boy's death fall had not been observed, so he hid the body and

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slipped away from Starflight House. Concealing his panic, he collected his wife and son from their apartment and took them to the spaceport. At gunpoint he forced a shuttle pilot to fly them up to the Bissendorf *which was waiting in orbit. Knowing that the dead child would be found at any moment, Garamond got through on the radio to his second-in-command and close friend,* CLIFF NAPIER, *and ordered him to blank out all communications between the* Bissendorf *and Earth. The precaution was taken just in time—back at Starflight HQ Harald's body had been discovered. Elizabeth had already slain the luckless servant who made the find, and had sent out an order that Garamond was to be brought back to her.*

Aboard his ship Garamond ordered it to leave the Solar System at maximum speed and was lucky in that the spatial "tide" was favorable to him. The ships employed by Earth could operate more efficiently in regions where the density of space was high, and in this case the local conditions enabled Garamond to escape his pursuers. The trouble was that he had nowhere to go—there was no point in fleeing to Terranova because Elizabeth's ships would be there waiting for him.

The Bissendorf *was provisioned for a year, so Garamond decided to use that time to follow up a private dream. He owned photographs of partially destroyed starmaps which had been found on Sagania, a planet which had been destroyed by a nuclear reaction thousands of years previously. Discrepancies in the maps suggested to Garamond that one star had been of special significance to the long-dead Saganians, and he decided to solve the mystery.*

On completing the four-month journey, the Bissendorf's *crew made an astonishing find—a sun completely enclosed within a spherical shell which was more than 300 million kilometers in diameters. They surveyed the object, located a single small entrance at its equator and one group passed through it to discover that the inner surface of the sphere was covered with vegetation and had breatheable air. Hulks of hundreds of destroyed spaceships were clustered outside the entrance and just inside it were ruins of ancient fortifications. A great battle had been fought there long ago, but there was no sign of life.*

The sphere, dubbed Orbitsville, appeared to offer perfect living space equivalent to many billions of Earths. The discovery elevated Garamond to a level of fame and importance at which he and his family seemed safe, even from Elizabeth Lindstrom. He sent a faster-than-light signal to Earth, reporting the find, then his science team began to investigate some of Orbitsville's mysteries, including the puzzle of why radio communi-

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cation was impossible within the sphere.

Four months later Elizabeth arrived at the head of a fleet, assumed control and in a tense interview with Garamond revealed that Starflight intended to exploit emigration to Orbitsville and parcel it out just as if it was a normal planet. Settlers begin to arrive almost immediately. Disillusioned and feeling useless, Garamond settled down with his family and watched the human settlement spread outwards into Orbitsville's infinite prairies—then a new discovery was made. Orbitsville was not empty and free for the taking. An alien civilization was encountered close to the entrance.

XI

RUMORS of massacre came within a month.

There had been a short-term lull while the shallow circular basin centered on Beachhead City absorbed the first waves of settlers. During that brief respite a handful of External Affairs representatives had arrived. Aware of their inadequacy, they had ruled that no humans were to go within five kilometers of the alien community until negotiations had been completed for a corridor to the free territory beyond. A number of factors combined, however, against the efficacy of the ruling. The Government men had arrived late on the scene. No broadcasting media were available to them. And—most important—there was a widespread feeling among the settlers that attempting diplomatic communication with the Clowns, as they were unofficially called, would be an exercise in futility.

At first the bright-hued aliens had been approached with caution and respect. Then it was learned that they possessed no machines beyond the simplest farming implements. Even their houses were woven from a kind of cellulose rope extruded from their own bodies in roughly the same way a spider produces its web. When it was further discovered that the Clowns were mute, the assumption that they were intelligent was called into question by many of the human settlers. One theory was that they were degenerate descendants of the race that had built the fortifications around the Beachhead City aperture; another held they were little more than domestic animals that had outlived their masters and developed a quasi-culture of their own.

Garamond was disturbed by the attitude implicit in the theories, partly because it was a catalyst for certain changes taking place among the Earth settlers. The subtle loosening of discipline he had noticed in his own men within minutes of their setting foot on Orbitsville had its counterpart among the immigrants in the form of a growing dis-

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regard for authority. Men whose lives had been closely controlled in the tight, compacted society of Earth now regarded themselves as potential owners of continents and were impatient for their new status. All they had to do to transform themselves from clerks to kings was to load up the vehicles provided by the Starflight workshops and set out on their golden journeys. The only directive was that they should travel far, because it was obvious that the farther a man went when fanning out from Beachhead City the more land would be available to him.

As the mood took hold, even the earliest arrivals—those who had staked out their plots of land within the circular hills—became uneasily aware of the incoming hordes at their heels. They decided to move onward and outward.

In a normal planetary situation the population pressures would not have been concentrated so fiercely on one point. But Earth technology was geared to the Assumption of Mediocrity. During the development of the total transport system of flickerwing ships and shuttles it had never occurred to anyone to make provision for an environment in which, for example, it would not be possible for a ship to gather its own reaction mass. Such provision would have been completely illogical in the universe as it was then understood—but in the contest of Orbitsville, a deadly mistake had been made.

Territories of astronomical dimensions were available certainly. But no means existed for claiming them quickly enough to satisfy the ambitions of men who had crossed space like gods and then found themselves reduced to wheeled transportation. Given time to build or import fleets of wing-borne aircraft, the difficulties could have been lessened but not eliminated completely. Each family unit or commune had to become self-supporting in the shortest possible time and, even with advanced farming methods and the use of iron cows, this meant claiming possession of large areas without delay.

It was a situation which, classically, had always resulted in man fighting man. Garamond was not surprised therefore when reports began to reach him that the outermost settlers had forced their way through the Clown city in a number of places and were pouring into the prairie beyond. Although he did not try to visit any of the trouble spots in person, he had no difficulty visualizing the course of events at each. Still haunted by the sense of having lost his purpose, he devoted most of his time to his family, making only occasional visits to the *Bissendorf* in his capacity of chief executive. He deliberately avoided watching the newscasts piped into his home along the landlines, but other channels now were open.

One morning, while sleeping off

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the effects of a prolonged drinking session, he was awakened by a child's scream. The sound triggered a synergistic vision of Harald Lindstrom falling away from the blind face of a statue and, almost in the same instant, came the crushing awareness that he had not been sufficiently on his guard against Elizabeth. Garamond jumped out of bed, gasping for air, and lurched to the living room. Aileen had got there before him and was kneeling with her arms around Christopher. The boy was now sobbing gently, his face buried in her shoulder.

"What happened?" Garamond's fear was subsiding, but his heart still pounded unevenly.

"It was the projector," Aileen said. "One of those things appeared on it. I turned it off."

Garamond glanced at the projection area of the solid-image television. "What things?" The faint ghost of a tutor on one of the educational programs was still dissolving into the air.

Christopher raised a streaked, solemn face. "It was a Crown."

"He means a Clown." Aileen's eyes were slaty with anger.

"A Clown? But . . . I told you to keep the images fairly diffuse when Chris is watching so that he won't get confused between what's real and what isn't."

"The image was diffused. The thing still scared him, that's all."

Garamond stared helplessly at his wife. "I don't get it. Why should he be afraid of a Clown?" He turned his attention to Christopher. "What's the matter, son? Why were you afraid?"

"I thought the Crown was coming to get me too."

"That was a silly thing to think—they never harmed anybody."

The boy's gaze was steady and reproachful. "What about all the people they froze? All the dead people."

Garamond was taken aback. "What!"

"Don't confuse him," Aileen said quietly. "You know perfectly well what's been in the newscasts for the last couple of days."

"But I don't! What did they say?"

"They told about the outer planet. When the things built Lindstromland, they shut off all light and heat to the outer planet and froze it over."

"Who? What things?"

"The Clowns, of course."

"But that's wonderful!" Garamond began to smile. "The Clowns created Orbitsville!"

"Their ancestors."

"I see. And there were people on the outer planet? People who got frozen to death?"

"They showed photographs of them." A stubborn note had crept into Aileen's voice.

"Where did they get these photographs?"

"A Starflight ship must have gone there, of course."

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"But, honey, if the planet is frozen over how could anybody take photographs of its surface or anything on it? Just think about that for a while."

"I don't know how they did it. I'm only telling you what Chris and I and everybody else have seen."

Garamond sighed. Going to the communicator, he called Cliff Napier on board the *Bissendorf*. The familiar head appeared at the projection focus and nodded a greeting.

Garamond spoke quickly, without preamble. "Cliff, I need information about ship movements within the Pengelly's Star system. Has there been an expedition to the outer planet?"

"No."

"You're positive?"

Napier glanced downward, looking at an information display. "Absolutely."

"Thanks, Cliff. That's all." Garamond broke the connection and Napier's apparently solid features faded into the air. "There you are, Aileen—a direct, clear statement of fact. Now, where are the photographs supposed to have come from?"

"Well, perhaps they weren't actual photographs. They might have been . . ."

"Artists' impressions? Reconstructions?"

"What difference does it make? They were shown . . ."

"What difference!" Garamond laughed shakily as the mental chasm opened between himself and his wife. Yet he felt no annoyance. Their marriage had always been simple and harmonious, and he knew it was based on deeper attachments than mere similarity in interests or outlook.

One of the first things he had learned to accept was the certainty of incompleteness on some levels of their relationship, and usually he knew how to accommodate it.

"It makes all the difference in the world," he said softly, as if speaking to a child. "Don't you see how your attitude toward the Clowns has been affected by what you've seen or think you've seen on the viewers? That's the way people are manipulated. It used to be more difficult, or at least they had to be more subtle when literateness was considered vital to education . . ." Even to his own ears the words sounded dry and irrelevant. He stopped speaking as he noticed Aileen's predictable loss of interest. His wife absorbed most of her information through images, and he had no pictures to show her. Garamond felt an obscure sadness.

"I'm not stupid, Vance." Aileen touched his hand, her intuition in sure control.

"I know."

"What did you want to tell me?"

"I just want you to remember that Starflight Incorporated is like—" he strove for a suitably vivid image—"like a snowball rolling

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down a hill. It keeps getting bigger and bigger, and it keeps going faster, and it can't slow down. It can't afford to stop, even when somebody gets in the way . . . and that's why it's going to roll right on over the Clowns."

"You always seem so certain about things."

"The signs are all there. The first step is to implant in people's minds the idea that the Clowns ought to be rolled over. Once that's been done, the rest is easy."

"I don't like the Crowns," Christopher said, breaking a long silence. His grain-gold face was determined.

"I'm not asking you to like them, son. Just don't believe that everything you see on the viewer is real and true. Why, if I went to the outer planet myself, I could . . ." Garamond stopped speaking as the idea quickly took hold.

"WHY not? After all, that's the sort of work the S.E.A. ships were designed to do," Elizabeth had said, reasonably, and at that point had smiled. "You're on indefinite leave, Captain. But if you would prefer to return to active service and visit the outer world, I have no objection."

"Thank you, my lady," Garamond had replied, concealing his surprise.

Elizabeth's imperfect smile had grown more secretive, more triumphant. "We will find it useful to

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possess some hard data about the planet—in place of all the speculations filling the air."

Garamond reviewed the brief conversation a number of times as the *Bissendorf* was extending its invisible wings and disengaging from fleet formation. It came to him that he had proposed the exploratory flight partly as a challenge to the President, hoping that a duel with her would resolve the growing doubts in his mind. Her ready agreement to the mission was the last thing he had expected. As well as drawing a few pointed comments from Aileen, it had left him feeling both disappointed and uneasy.

He sat in the control gallery for hours, watching the bright images of the other Starflight ships perform the patient maneuvers that would bring each one in turn to the entrance of Orbitsville to discharge its load of human beings or supplies. When the *Bissendorf's* own progression had taken it out through the regulated swarm, and nothing but stars lay in front, Garamond remained on station. He watched the irregular stabs of the main electron gun, the ghostly blade of energy that flickered through space ahead of the ship. The harvest of reaction mass was not plentiful in the immediate vicinity of Pengelly's Star, so in the early stages of the flight it was necessary to ionize the cosmic dust to help the intake fields do their work.

Gradually, however, as the ship spiraled outward, the night-black plain of Orbitsville's shell ceased to blank off an entire half of the visible universe. The conditions of space became more normal. Speed began to build up. Once again Garamond had difficulty in setting his perceptions to the correct scale. Everything in his past experience conspired to make him think he was in a tiny ship painfully struggling to a height of a few hundred kilometers above a normal-sized planet, whereas at a hundred million kilometers out it was still necessary to turn one's head through ninety degrees to take in both edges of Orbitsville's disk.

The size of the sphere was, in a way, painful to Garamond, causing familiar questions to seethe again in his mind. Was the fact that it was large enough to accommodate every intelligent being in the home galaxy a clue to its purpose? Why was there only one entrance to such a huge construction? Did the physics of the sphere's existence dictate of necessity that neither flickerwing ship nor radio communicator could operate inside it? Or were those features designed in by the Creators to preserve the effectiveness of the sphere's size, to prevent ingenious technicians turning it into a global village with their FTL ships and television networks? And where were the creators now?

Napier appeared with two bulbs of coffee, handed one to Gara-

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mond. "The weather section reports that the local average density of space is increasing according to their predictions. That means we should be able to pick up enough speed to reach the outer planet in not much more than a hundred hours."

Garamond nodded. "The probe torpedo should be fitted out by then."

"Sammy Yamoto wants to lead a manned descent to the surface."

"That could be dangerous. We'll have to get a better report on the surface conditions before authorizing anything like that." Garamond sipped coffee, then frowned. "Why should our Chief Astronomer want to risk his neck out there? I thought he was still wrapped up in his globular filigree of force fields."

"He is. But he reckons he can deduce a few things about how Orbitsville was built by examining the outer planet."

"Tell him to keep me posted." Garamond looked at Napier over the mouthpiece of his coffee bulb and saw an uncharacteristic look of hesitancy on the big man's face. "Anything else coming to a boil?"

"Shrapnel seems to have gone AWOL."

"Shrapnel? The shuttle pilot?"

"That's right."

"So he took off. Isn't that what we expected?"

"I expected him to do it once, but not twice. He disappeared for the best part of a day soon after the Starflight crowd first arrived. At the time he was on ground detachment. So I decided he had gone back to Starflight with a hard-luck story, and I wrote him off—but he was back on duty again that same night."

"That surprised you?"

"It did, especially as he returned without the chip on his shoulder. His whole attitude seemed to have changed for the better. Why, since then he's been working like a beaver!"

"Maybe he discovered he didn't like the Starflight HQ staff."

Napier looked unconvinced. "He didn't object or try to cry off when orders were posted for this flight, but he isn't on board."

"I'd just forget about him."

"I'm trying to," Napier said. "But the *Bissendorf* isn't a sailing ship tied up in harbor. A man able to come and go unofficially must have organization behind him. It makes me think Shrapnel has contacts in Starflight."

"Let's have some whiskey," Garamond suggested. "We're both getting too old for this type of work."

EVEN before it was denied the light and heat of its own sun, the outer planet of the Pengelly's Star system had been a bleak sterile place.

Less than half the size of Earth, it had no atmosphere at all. It was a ball of rock and dust patroling a

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lonely orbit so far out that its parent sun appeared as little more than a distant star casting barely perceptible shadows in an inert landscape. And when that sun vanished it made little difference to the planet. Its surface became a little colder and a little darker, but the cooling stresses were not great enough to cause anything as spectacular as movements of the crust. Nothing stirred in the blackness except infrequent puffs of dust from meteor strikes, and the uneventful millenia continued to drag by as they had always done.

Using its radar fans like the feelers of a giant insect, the *Bissendorf* groped its way into orbit around the invisible dead world.

Garamond's ship was in the form of three equal cylinders joined together, the central one projecting forward from the other two by almost half its length. The command deck, administrative and technical levels, living quarters and workshops were contained in the central cylinder. This exposed position meant that the inhabited regions of the vessel could have been subjected to intense bombardment during high-speed flight, when—due to the ship's own velocity—even stationary motes of interstellar dust registered as fantastically energetic particles. The problem had been solved by using the same magnetic deflection techniques that guided the particles into the ramjet's thermonuclear reactors. Both the *Bissendorf's* flux pumps shaped their magnetic lines of force into the form of a protective shield around which the charged particles flowed harmlessly into the engines.

An inherent disadvantage of the system was that a starship could never coast at high speed; with the flux pumps closed down, the crew would quickly fry in self-induced radiation. By the same token, communications with a ship under way were precluded and even radar sensing could not be employed. The approach to the dark planet had been made at modest interplanetary speeds, however. Hence the *Bissendorf* was able to proceed by using its main drive in short bursts, between which it was possible to run position checks. Because it was designed for exploration work in unknown planetary systems, the vessel was further equipped with conventional nuclear thrusters and a limited amount of stored reaction mass which gave it extra capability for close maneuvering. The task of slipping into stable orbit was therefore accomplished quickly and efficiently, even though the target planet remained invisible to the *Bissendorf's* crew.

It took only one pass to enable the long-range sensors and recording banks to answer all Garamond's questions.

"Pretty disappointing," Sammy Yamoto mourned, examining the glowing numerals and symbols of

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the preliminary analysis. "The planet has no atmosphere now, appears never to have had any. Its surface is completely barren. I was hoping for the remains of some kind of plant life which would have told us whether the radiation from the primary was cut off suddenly or over a period of years."

Chief Science Officer O'Hagan spoke. "We can still do a lot with samples of dust and rock from the surface."

Yamoto nodded without enthusiasm. "I guess so. But botanical evidence would have been so precise. So nice. With nothing but inorganic evidence, we're going to have margins of error of—what? A thousand years or more?"

"On an astronomical timescale that's not bad."

"It's not bad, but it's not . . ."

"Is it the opinion of the group," Garamond interrupted, "that a manned descent is still worth while?"

O'Hagan glanced around at the other science officers anchored close to the information display, then shook his head. "At this stage it would be enough to drop a robolander and take three or four cores. Somebody can always go down if the cores prove of exceptional interest. But I don't hold out much hope they will."

"Right—it's decided we send down one probe." Garamond used his end-of-meeting voice. "Get it there and back as quickly as possible, and include flares and holorecording gear in the package. I want to be able to present certain people with visible evidence."

Denise Serra, the physicist, raised her eyebrows. "I heard the Starflight Information Bureau was propagating some fantasy about a beautiful civilization being snuffed out in its prime. Naturally I didn't believe it. I mean, who would swallow an idea like that?"

"You'd be surprised," Garamond told her ruefully. "I've been learning there are different kinds of naivety. We're subject to one kind—it's an occupational hazard associated with spending half your life cut off from the big scene. But there are other kinds just as dangerous."

"That may be so—but to believe that the Clowns created Orbitsville!"

"Genuine belief isn't required. The story is only a formula that allows certain manipulations to be carried out. We all know the square root of minus one is an unreal quantity, and yet we've all used it when it suited us to do so. Same thing."

Denise's eyes twinkled. "Not the same at all!"

"I know. I was just trying to indicate the general class of thing we were talking about."

"Neat footwork." Denise laughed outright, and for no reason immediately apparent to him Garamond suddenly became aware of

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how much he enjoyed simply looking at her. To him the phrase "easy on the eyes" had always been pure metaphor. Now he was surprised to discover that letting his gaze rest on the physicist's pale sensitive face actually did produce a soothing sensation in his eyes. The phenomenon entranced and then disturbed him.

When the meeting broke up he went to his own quarters. There he devoted several hours to his principal spare-time occupation: recording television interviews for Colbert Mason. The reporter, after his initial difficulties on Orbitsville, had established himself in a position of relative strength, and had obtained an office in Beachhead City from which he sent back to the Two Worlds a prolific stream of news stories for syndication. Garamond cooperated with him, mainly because in his estimation his personal fame was still his family's best protection against Elizabeth Lindstrom.

There were times when he was almost persuaded by Aileen that he was wrong in his suspicions of the President. But against that were persistent rumors that she had slain the member of her domestic staff who had found her son's body. Garamond continued to maintain his defenses. The system was that Mason supplied him with tridi tapes of recorded questions, and when Garamond had time he used his own equipment to fill in his answers and comments.

On a number of occasions Mason had confessed that he was making a fortune from the arrangement. He had proposed sharing the profits. Garamond had refused to accept any money, stipulating only that Mason obtain for the stories and interviews the widest possible exposure. It appeared that this objective was being achieved. There was a growing clamor for the discoverer of Lindstromland to make a personal appearance to Earth.

Garamond spent most of the current session giving suitable reasons for not being able to return, and describing in precise detail what had been learned about the invisible outer planet. Assuming the material would be safely relayed to the Two Worlds by Mason and broadcast on the planet-wide networks, it would go a long way toward killing any suggestion that the Clowns had obliterated an entire civilization.

He stored away the tapes carefully, again pondering the great latitude Elizabeth was permitting him. Then he fastened himself into his bed with the intention of catching up on his sleep.

The slow-drifting cubes of colored radiance merged and shimmered in the air above him, creating hypnotic patterns. Once more there came the idea that he might be completely wrong about Elizabeth Lindstrom, and he found himself wishing it were possible to discuss

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the subject emotionlessly and on an intellectual plane with his wife. There would be, he decided sleepily, no communications problem with a woman like Denise Serra who shared his background and his interests, and who produced that curiously pleasant sensation in his eyes . . .

Garamond slept.

He awoke two hours later with an unaccountable sense of unease. He decided to put through a call to Aileen and Christopher before going to the control gallery. The communications room made the necessary connections and in less than a minute Garamond was looking at the image of his wife. But a winking sphere of amber told him he was viewing and hearing a recording. It said:

"I was hoping you would call, Vance. I know you're on only a short trip, but Chris and I have got so used to having you with us lately that we're spoiled. So the time is passing slowly. Something exciting has happened, though. You'll never guess." The unreal Aileen paused for a moment, smiling, to demonstrate to Garamond his inability to divine what was coming next. "I had a personal call from the President—yes, Elizabeth Lindstrom herself! She invited Chris and me to stay with her in the new Lindstrom Center for a few days . . ."

"Don't go!" Garamond was unable to restrain the words.

". . . knew I'd be feeling lonely while you were away," the image was saying contentedly, "but what really decided me was that she said she was the one who would benefit most from the visit. She didn't actually put it into words, but I think she is looking forward to seeing a child about the place again. Anyway, Vance, the President's car is calling for us in a few minutes. By the time you hear this I'll be wallowing in luxury and high living at the Octagon. But don't worry—I'll be at home to cook you a meal when you arrive. Love you, darling. Bye."

The image dissolved into a cloud of fading stars, leaving Garamond cold, shaken, and angry at his wife. "You silly bitch," he whispered to the fleeting points of light. "Why do you never, ever, *never ever*, listen to anything I tell you?"

The last handful of stars vanished in silence.

THE probe torpedo worked its way up the gravity hill from the dead planet, carrying its samples of dust and rock, and homed in on the *Bissendorf*. Although there was a sun only three astronomical units away, its light was screened off and the torpedo was moving through a blackness equivalent to that of deep interstellar space.

In that darkness the mother ship appeared to some of the probe's sensors as a faint cluster of lights, but to other sensors concerned with different sections of the electromag-

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netic spectrum the ship registered as a brilliant beacon whose radiation embodied many voices commanding, guiding, coaxing the torpedo homeward. Responding with greater and greater precision as the electronic voices grew louder, it approached the ship with the familiarity of a parasite fish flitting about a whale. At last it made physical contact and was taken on board.

During the final maneuvers Garamond had waited on the *Bissendorf*'s control gallery with growing impatience. As soon as the signal announcing closure of the docking bay was received, he gave the order for the main drive to be activated. Initial impetus was given the ship by the relatively feeble ion thrusters, but that propulsion system was shut down when the ramjet intake field had been fanned out to its maximum area of half-a-million square kilometers and reaction mass was being scavenged from surrounding space.

As the scooped-up hydrogen and other matter were fed into the fusion reactors, the ship wheeled away sunwards. The acceleration restored close-to-normal gravity throughout the inhabited levels of the central cylinder.

The feeling of the deck pressing firmly on the underside of his feet helped Garamond regain his composure. He assured himself that if Elizabeth were to move against his family it would be done anywhere but in the crystal cloisters of her new residence.

Into the bargain, Elizabeth knew that Garamond would be back from the dark planet in only a few days, imbued with an even greater amount—if that were possible—of the power called fame. The hours and the duty periods went by and, as Orbitsville filled the forward view panels with its unrelieved blackness, Garamond was able to satisfy himself that he had panicked for no good reason.

The *Bissendorf* had accomplished turnover at midpoint on the return journey, and was two days into the retardation phase, when explosions occurred simultaneously in both field generators. The vessel was robbed of its means of coming to a halt before it would smash into the impregnable outer shell of Orbitsville.

XII

"THE starboard explosion was the worst," Commander Napier reported to the emergency meeting of the *Bissendorf*'s executive staff. "It actually breached the pressure hull in the vicinity of Frame S203. The pressure-activated doors functioned properly and sealed off the section between Frames S190 and S210, but there were five technicians in there at the time and they were killed.

O'Hagan raised his gray head. "Blast or decompression?"

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"We don't know. The bodies were exhausted into space."

O'Hagan made a note on his pad. "Five missing, presumed dead."

Napier stared at his old antagonist with open dislike. "If you know how we can turn the ship to recover the bodies this would be a good time to tell us about it."

"I merely . . ."

"Gentlemen!" Garamond slapped the table as loudly as possible in conditions of almost zero gravity. "May I remind you that we are scheduled to be killed in about eight hours? That doesn't leave much time for bickering."

O'Hagan gave a ghastly smile. "It gives us eight hours for bickering, Captain. There's nothing else we can do."

"That's for this meeting to decide."

"So be it." Chief Science Officer O'Hagan shrugged, spread his dry knobby hands in resignation.

Garamond felt a reluctant admiration for the older man, who seemed determined to remain egotistical and cantankerous right to the end. O'Hagan also had a habit of being right in everything he said, and in that respect too it seemed he was going to preserve his record. Although reaction mass was not plentiful in the region of Pengelly's Star, the *Bissendorf* had been aided in its return journey by the pull of the primary and had achieved a mean acceleration of close to one gravity. So the ship had been traveling 1,500 kilometers a second at turnover point. Although it had been slowing down steadily for two days when the explosions occurred, its residual velocity was still above a hundred kilometers a second. At that speed the ship was due for impact with Orbitsville in only eight hours.

Garamond could swear there was nothing he or anybody else on board could do about it. The knowledge of doom boomed and pounded through his brain. Yet he felt no fear or any related emotion. Their absence, he decided, was a psychological byproduct of having eight hours in hand. The delay created an illusion that something might still be done, that there was a chance to influence the course of events. Miraculously, hope held good even for an experienced flickerwing man who understood only too well the deadly parameters of the situation.

"I understand that both auxiliary drive systems are still functional," Administrative Officer Mertz was saying, his round face glowing like pink plastic. "Surely that makes a difference."

Napier shook his head. "The ion tubes are in action right now—which accounts for the slight weight we can feel. But those tubes are intended only to give the ship close-maneuvering capability. They won't affect our speed very much. I guess the only difference they'll make is

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that we'll vaporize against Orbitsville a minute or two later than we would otherwise."

"Well, what about the secondary nuclears? I thought they were for collision avoidance."

"They are. Maximum endurance twenty minutes. By applying full thrust at right angles to our present course we could easily avoid an object as large as Jupiter—but we're dealing with that!" Napier pointed at the forward view panels, which were uniformly black. Orbitsville spanned the universe.

Mertz's face had lost some of its pinkness. "I get the picture. Thanks."

The operations room was silent except for faint irregular clangs transmitted through the ship's structure. Far aft, a repair crew was at work replacing the damaged hull sections. Garamond stared into the darkness ahead and tried to assimilate the idea that it represented a wall across the sky, a wall rushing toward him at a hundred kilometers a second, a wall so wide and high there was no way to avoid hitting it.

Yamoto cleared his throat. "There's no point speculating why the ship was sabotaged. Still, I'm curious. Do we know how the bombs got aboard?"

"I personally believe it was the work of Pilot Officer Shrapnel," Napier said. "There isn't much evidence, but what there is points to him. We mentioned our suspicions in our emergency call to Fleet Control."

"What did they say?"

"They promised he would be investigated." Napier's voice had a flinty edge of bitterness. "We are assured that all necessary steps will be taken."

"That's good to know. Isn't that good to know?" Yamoto pressed the back of a hand to his forehead. "I had so much work still to do. There was so much to learn about Orbitsville."

They're going to learn at least one thing as a result of this mission, Garamond thought. *They're going to find out how the shell material stands up to the impact of fifteen thousand tons of metal traveling at a hundred kilometers a second. And they won't even have to go far from the aperture to see the big bang . . .* Garamond felt an icy convulsion in his stomach as he half-glimpsed an idea. He sat perfectly still for a moment as the incredible thought began to form, to crystallize to the point at which it could be put into words. His brow grew chill with sweat.

"Has anybody," Denise Serra asked in a calm, clear voice, "considered the possibility of adjusting our course in such a way that we would pass through the aperture at Beachhead City?"

Again the room filled with silence. Garamond felt a curious secondary shock on hearing the words he was still formulating being

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uttered by another person. The silence lasted for perhaps ten seconds, then was broken by a dry laugh from O'Hagan.

"You realize that at our speed, Miss Serra, running into a wall of air would be just like hitting solid rock? I'm afraid your idea doesn't change anything."

"We don't have to run into a wall of air. Not if we turn the ship over again and go in nose first with the electron gun operating at full power."

"Nonsense!" O'Hagan shouted. He cocked his head to one side as if listening to an inner voice, and his fingers moved briefly on the computer terminal before him. "It isn't nonsense, though." He corrected himself without embarrassment, nodding his apologies to Denise Serra. Others at the conference table promptly began to address the central computer through their own terminals.

Suddenly everyone was trying to speak.

"Overload power on the gun should give us enough voltage for the few seconds we would need it. It should be enough to blast a tunnel through the atmosphere—"

"At this stage we have enough lateral control over our flight path to bring it through the aperture—"

"But remember we haven't got the full area of the aperture as a target. We'd be going in at an angle of about seventy degrees—"

"It's still good enough—as long as no other ships get in the way—"

"There's still time to do some structural strengthening on the longtitudinal axis—"

"We'll shed enough kinetic energy . . ."

"Hold it a minute," Garamond commanded, raising his voice above the optimistic clamor. "We have to look at it from all angles. If we did go through the aperture, what would be the effect on Beachhead City?"

"Severe," O'Hagan said reflectively. "Imagine one purple hell of a lightning bolt coming up through the aperture, immediately followed by an explosion equivalent to that produced by a tactical nuclear weapon."

"There'd be destruction?"

"Undoubtedly. But there's plenty of time to evacuate the area—nobody would have to die."

"Somebody mentioned colliding with another ship."

"That's only a minor problem, Vance." O'Hagan looked momentarily surprised at having used Garamond's given name for the first time in his life. "We can advise Fleet Control of our exact course, and they'll just have to make certain the way is clear."

Garamond tried to weigh the considerations but he could see only the faces of his wife and child. "Right! We do it. I want a copy of the decision network plan, but start taking action right away. In the

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meantime I'll talk to Fleet Control."

The ten science-oriented and engineering officers at the table instantly launched into a polygonal discussion. The noise level in the room further shot up as communications channels were opened to other parts of the ship. Within a minute perhaps thirty other men and women were taking part in the conference, many of them vicariously present in the form of miniaturized, but nonetheless solid and real-looking, images of their heads, which transformed the long room into a montage of crazy perspectives.

Garamond could feel the wave-crest of hope surging through all the levels of the disabled vessel. He told Napier to make an announcement about the situation over the general address speakers, then went into his private suite and put through a call to Fleet Control. It was taken not by the Fleet Movements Controller, as Garamond had expected, but by a Starflight admin man, Senior Secretary Lord Nettleton. The Senior Secretary was a handsome silver-haired septuagenarian who had a reputation for devotion to the Lindstrom hierarchy. He was of a type that Elizabeth liked to have around, capable of presenting a benign fatherly image while keeping himself remote from the inner workings of the system.

"I was expecting somebody on the operations side," Garamond said, dispensing with the standard formal mode of address.

"The President has taken the matter under her personal control. She is very much concerned."

"I'll bet."

"I beg your pardon?" Nettleton's resonant voice betrayed an open challenge to Garamond to speak his mind.

Again Garamond thought about his wife and child. "The President's concern for the welfare of her employees is well known."

Nettleton inclined his head graciously. "I'm aware of how futile words are under the circumstances, Captain Garamond. But I would like to express my personal sympathy for you and your crew in this . . ."

"The reason I called is to inform Starflight that the *Bissendorf* has enough lateral control to enable it to pass through the aperture into the interior of Orbits—uh—Lindstromland, and that is what I intend to do."

"I don't quite understand." Nettleton's image underwent several minute but abrupt changes of size that told Garamond other viewers were switching into the circuit. "I am informed that you are traveling at a hundred kilometers per second and have no means of slowing down."

"That's correct. The *Bissendorf* is going to hit Beachhead City like a bomb. You will have to evacuate

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the area around the aperture. My science staff can help with the estimates of how widespread the damage will be, but in any case I strongly recommend that you issue warnings immediately. You have less than eight hours." Garamond went on to explain the proposed action in detail, while continued perturbations of the image showed that his unseen audience was increasing every second.

"Captain, what happens if your ship misses the aperture and strikes the shell material below the city itself?"

"We are confident of passing through the aperture."

"All you're saying is that the probability is high. But suppose you do miss?"

"It is our opinion that the shell would be undamaged."

"But the shell is one of the greatest scientific enigmas ever! On what do you base your predictions about its behavior under that sort of impact?"

Garamond allowed himself a smile. "In the last hour or so our instinct about these things has become highly developed."

"This is hardly a time for jokes." Nettleton looked away for a moment, nodded to someone off screen. When he turned back to Garamond his eyes were somber. "Captain, have you thought about the possibility that Starflight may not be able to grant you permission to aim for the aperture?"

Garamond considered the question. "No—but I've thought about the fact that there is absolutely nothing Starflight can do to stop me."

Nettleton shook his head with regal sadness. "Captain, I'm going to put you through to the President on a direct connection."

"I haven't the time to speak to Liz," Garamond told him. "Just send a message to my wife that I'll be back with her as soon as I can." He broke the connection and returned to the operations room, hoping he had sounded more confident than he felt.

LINDSTROM Center was austere compared to its equivalent on Earth. Nevertheless it was the largest and most palatial building on Orbitsville. Octagonal in plan, it had been built on a slight eminence some twenty kilometers east of Beachhead City, to which it was joined by power and communications cables stretched on low pylons. No attempt had yet been made to sculpt the hill according to the President's ideas of what it ought to be, so the glass-and-acrylic edifice was incongruously lapped by a sea of grass. Its first three floors housed those elements of the Starflight administration that the supreme executive had transported from the Two Worlds. The top floor was her private residence.

On this evening, the guards who patroled the perimeter fence were

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distinctly uneasy. They had heard that a maniac of a flickerwing captain was going to try to crash his vessel through the aperture at interplanetary speed, and the rumor had even quoted an exact minute for the event to occur—20.06 Compatible Local Time. As the moment grew nearer each man felt a powerful urge to fix his gaze on the distant scattering of buildings, just below the up-curved horizon, which was Beachhead City. They had been told that most of the city had been hastily evacuated to escape the promised pyrotechnics, and nobody wanted to miss the spectacle.

At the same time, however, their eyes were frequently drawn upward to the transparent west wall of the Presidential suite. Elizabeth Lindstrom herself could be glimpsed up there, screened only by sky reflections, her silk-sheathed abdomen glowing like a pearl. It was well known that she sometimes kept watch on her guards through a magnifying screen. None of the men relished the idea of being dismissed from Starflight service and sent back to the crowded towerblocks of Earth; yet the compulsion to stare into the west grew greater with each passing minute.

The suspense was also making itself felt on the top floor of the Octagon. But in the case of Elizabeth Lindstrom it was a pleasurable sensation; heady and stimulating, akin to pre-orgasmic tension.

"My dear," she said warmly to Aileen Garamond, "do you think you are wise to watch this?"

"Quite sure, My Lady."

"But the boy . . ."

"I'm positive my husband knows what he is doing." Aileen's voice was firm and unemotional as she placed her hands on her son's shoulders, forcing him to face the west. "Nothing will go wrong."

"I admire your courage, especially when the chances are so . . ." Elizabeth checked herself just in time. The common characterless woman beside her appeared genuinely to believe that a ship could run into a solid wall of air at a speed of a hundred kilometers a second and not be destroyed on the instant. Elizabeth was girded with the mathematics that showed how incredible the idea was, but she knew the equations would mean nothing to her guest. In any case, she had no desire to break the news in advance. She wanted to watch Mrs. Garamond's face as she saw her husband's funeral pyre blossom on the horizon. Only then would Elizabeth receive the first payment against the incalculable debt the Garamond family owed her.

The idea of grief canceling grief, of pain atoning for pain, was one that few people could properly understand, Elizabeth had often told herself. Even she had not appreciated the logic of it until days after Harald's small body had been cast in sun-colored resin and stood in its place in the Lindstrom

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chapel. But the concept was so true!

There were no flaws in the system of double entries—anguish against anguish, love against love. This realization had given Elizabeth the strength to go on even when it appeared that the Garamonds had chosen to die in the black deeps of space. That episode had been nothing more and nothing less than God's way of telling her that he was simply building up the Garamond's credit to the point at which it could be used to wipe out all their debts. In retrospect, it had been fortunate that she had not been able to extract payment immediately, because there would still have been an imbalance and she would never have found her heart's ease. A child is a focus, a repository of love added to each year of its life, and it was crystal-clear that the death of a boy of nine could never be compensated for by the death of a boy of . . .

"I have the latest computations for you, My Lady." The projected voice of Lord Nettleton broke in on Elizabeth's thoughts. "The impact will occur in exactly three minutes from . . . now."

"Three minutes," Elizabeth said aloud, knowing that the accurately beamed sound would not have reached the other woman's ears. Without giving any sign that she had heard, Aileen picked up her son so that her face was screened by the boy's body. Elizabeth moved quietly to the other side, as was her due, and waited.

She waited through eons and eternities.

And the ribbed canopy of the sky ceased to turn.

Time was dead . . .

THE lightning bolt came first. An arrow-straight line of hell. Searing upward at an angle into the heavens. Isolated for the first perceptible instant, then joined by writhing offshoots, tributaries and deltas of violet fire that flickered and froze on the retina. Faint shadows fled across the sky as the air above Beachhead City was turmoiled by the fountain of energy.

Appalling though the general display was, there was projected from its core, on the threshold of vision, a sense of even greater forces in the shock of opposition. There was a feeling of cataclysmic upward movement, then a bright star burned briefly and dwindled in the southwest. The day returned to normalcy, though darker than it had been before.

Elizabeth drew a deep quavering breath. No other death she had ever witnessed had been so final. She turned her gaze to Aileen Garamond's face, and was shocked to see there a look of serenity.

"It was to be expected," she said.

"I know." Aileen nodded contentedly, and hugged her child. "I told you."

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Elizabeth gaped at her. "You fool! You don't think he's still alive after what you've just . . ." She was forced to stop speaking as the waves of thunder rolling out from Beachhead City, slow-moving in the low-pressure air of Orbitsville, engulfed the building. Reflections of lights stretched and shrank and stretched again as the transparent walls absorbed energy. Small objects throughout the room stirred uneasily in their places. Christopher buried his face in his mother's hair.

"Your husband is dead," Elizabeth announced when silence was restored to the room. "But because you are the widow of the most distinguished of all my S.E.A. captains, you will remain here as my guest. No other arrangement would be acceptable."

Aileen faced her, pale but immovable. "My Lady, you are mistaken. You see—I know!"

Elizabeth shook her head incredulously and a little sadly. She had been planning to spend perhaps a year in a game of subtleties and suggestions, watching the other woman's slow progression from doubt to certainty about her son's eventual fate. But in view of Aileen Garamond's mentality, or lack of it, it was obvious now that such strategies would be ineffective. If full payment were to be extracted, as God as decreed, the President would have to speak plainly, to the point.

Elizabeth touched a beautiful micro-engineered ring on her left hand, insuring that no listening devices could operate nearby. Then she explained in words a child could understand the accountancy of retribution. Christopher Garamond would be allowed another three years. He was to have the same lifespan as Harald Lindstrom—but not a day more.

When she had finished, she summoned her physician. "Captain Garamond's death has left Mrs. Garamond in a state of hysteria. Give her suitable sedation."

Aileen opened her mouth to scream. But the physician, an experienced man, touched her wrist in a quick movement that did not even disturb the boy she was holding in her arms. As the cloud of instant-acting drug diffused through her skin, Aileen relaxed and allowed herself to be led away.

Alone again, Elizabeth Lindstrom stood looking out across the western grasslands. For the first time in more than a year, she was feeling something approaching happiness. She began to smile.

XIII

THE integrity of the *Bissendorf's* design was so great, and the onboard preparation had been so thorough, that less than a tenth of the crew died as a result of the passage through the eye of the needle.

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Every available man and woman had been co-opted into teams. Some had welded into place new computer-designed structures, making load paths actually utilizing the forces of the impact to give the shell enough strength to survive. Until only minutes before the hellish transit, other gangs had swarmed on the skin of the ship, adding hundreds of sacrificial anodes to those already in place to serve as focal points for the ion exchanges that otherwise would have eaten away the hull during normal flight. The new anodes, massive slabs of pure metal, had withstood the brief but incredibly fierce attrition of the lightning wreathing the ship as it had passed through the atmospheric tunnel created by its electron gun. On emerging from its ordeal the *Bissendorf's* principal dimensions had altered, in some cases by several meters. But it had gone in with all pressure doors sealed—in effect it had been converted into dozens of separate, self-contained spaceships—and there had been no loss of life due to compression.

The entire crew had donned spacesuits for primary protection, had been injected with metallic salts. The ship's restraint fields had been stepped up to overload intensity, creating an environment in which any sudden movement of human tissue would be resisted by a pervasive jelly-like pressure from all sides. This measure, while undoubtedly a major factor in crew survival, also unavoidably caused a number of deaths. In the few sections where severe structural failure occurred some of the occupants had "fallen" varying distances under multiple gravities, and the heat induced by electromotive interaction had caused their blood to boil. But for the vast majority the internal bracing of their organs against immense G-shocks had meant the differences between life and death.

And yet all the preparation, all the frenzied activity, would have amounted to nothing more than a temporary stay of execution had it not been for the exotic nature of Orbitsville itself.

The synthetic gravity of the shell material attenuated much more rapidly than that of a solid mass. Although the *Bissendorf's* slanting course was drawn into the shape of a parabola, the curve remained flat. So the crew had sufficient time to control their reentry into the atmosphere from the inner vacuum of Orbitsville. The vessel's ion tubes and short-term reaction motors were effective against the weak pull of the shell, and it was possible for the *Bissendorf* to skip along the upper fringes of the air shield, gradually shedding velocity. It was even possible, using the fading reserves of reaction mass, to bring the ship down in one piece, with no further loss of life.

What was manifestly impossible, however, was to make the ship fly

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again. All its external sensors had been seared cleanly from the hull. Many of the internal position-fixing devices had been destroyed or confused by the unnatural physics of Orbitsville.

Of course, the clocks were still in operation. They had recorded a time lapse of five days. Five days from the passage through the Beachhead City aperture to the final touchdown on a hillside far into the interior. Starting from that basic fact, and using only a pocket calculator, it took just a few seconds for those on board to realize that they had traveled a distance of more than fifteen million kilometers from the aperture.

In terms of the overall size of Orbitsville the journey was infinitesmal. A short hop, a stone's throw, a jump across sunlit grass and woodlands. But in human terms the distance was more of a barrier than mountains or torrents. It was known, for instance, that back on Earth many a country postman had in his lifetime walked a total distance equal to a trip to the Moon, but that was only 385,000 kilometers. Walking back to Beachhead City would have been a task to be carried out by successive generations over a period of a thousand years.

Using the vast resources of the *Bissendorf's* workshops it would be possible to build a fleet of vehicles that might cut the journey time down to a mere century—except that wheels and other components would wear out in a matter of months. It would not be possible to transport the maintenance and manufacturing facilities that might enable the caravan to complete its golden journey.

There was also the difficulty that no man or machine knew the exact direction in which to travel. It was possible to get a rough bearing from the angle of the day and night ribs across the sky, but a rough bearing would be of no value. At the distances involved, a deviation of only one degree would cause the train to miss Beachhead City by hundreds of thousands of sun-drenched kilometers.

By the time the dead had been buried, the day was well advanced. The remaining men and women of the *Bissendorf's* crew were ceasing to be citizens of Earth. They were experiencing the infinity-change, the wistful, still contentment bestowed by the motionless sun of Orbitsville. Garamond bethought himself of a verse:

. . . that calm Sunday that
goes on and on,
When even lovers find their
peace at last,
And Earth is but a star, that
once had shone.

XIV

"WE'RE going back," Garamond announced flatly.

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He studied the faces of his executive staff, noting how each officer was reacting. Some looked at him with open amusement, others stared downward into the grass, seemingly embarrassed. Behind them, farther along the hillside, the great scarred hulk of the *Bissendorf* shocked the eye. Beyond it, microscopic figures moved on the plain in the rituals of a ball game. The sun hung directly overhead, as always, creating only an occasional flicker of diamond-fire on the dark-blue waters of a chain of lakes banding the middle distance.

Garamond began to feel that his words had been absorbed by Orbitsville's green infinities, sucked up cleanly before they reached the ears of his listeners. He resisted the urge to repeat himself.

"It's a hell of a long way," Napier said, finally breaking the heavy silence. His statement of the obvious, Garamond knew, constituted a question.

"We'll build aircraft."

O'Hagan cleared his throat. "I've already thought of that, Vance. We have enough workshop facilities still intact to manufacture reasonable subsonic aircraft, and the micropedia can give us all the design data. But the distance is just too great. You run into exactly the same problem as with wheeled vehicles. Your aircraft might do the trip in three or four years—except that we haven't the resources to build a plane that could fly continuously for that length of time. And we couldn't transport major repair facilities." O'Hagan glanced solemnly around the rest of the group, reproving them for having left it to him to deal with a wayward non-scientist.

Garamond shook his head. "When I said we are going back, I didn't mean all of us, in a body. I meant that I am going back, together with any of the crew sufficiently determined to try it—even if that means only half a dozen of us."

"But . . ."

"We're going to build a fleet of perhaps ten aircraft. We're going to incorporate as much redundancy as is compatible with good aerodynamics. We're going to fly our ten machines towards Beachhead City, and each time one of them breaks down we're going to take the best components out of it and put them in the other machines, and we're going to fly on."

"There's no guarantee you'll get there, even with the last aircraft."

"There's no guarantee I won't."

"I'm afraid there is." O'Hagan's expression had become even more pained. "There's this problem of direction. Unless you've got a really accurate bearing on Beachhead City, there's no point in setting out."

"I'm not worried about getting a precise bearing," Garamond said, making a conscious decision to be enigmatic. He was aware that in the

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very special circumstances of the *Bissendorf's* final flight the whole concept of command structure, of the captain-and-crew relationship, could have easily lost its validity. It was necessary at this stage to reestablish himself in office without the aid of insignia or outside authority.

"How do you propose to get one?"

"I propose instructing my science staff to attend to that chore for me. There's an old saying about the pointlessness of owning a dog and doing your own barking." Garamond fixed a challenging gaze in turn on O'Hagan, Sammy Yamoto, Morrison, Schneider and Denise Serra. He noted with satisfaction that they were responding as he had hoped. Already there were signs of abstraction, of withdrawal to a plateau of thought upon which they became hunters casting nets for a quarry they had never seen but would recognize at first sight.

"While they're sorting that one out," Garamond continued, speaking to Napier before any of the science staff could voice objections, "we'll convene a separate meeting of the engineering committee. The ship has to be cut up to get the workshop floors level. In the meantime I want the design definition drawn up for the aircraft and the first production tapes prepared." He walked toward the improvised plastic hut he was using as an office. Napier, striding beside him, gave a dry cough.

"TB again?" Garamond said with mock sympathy.

"I think you're going too fast, Vance. Concentrating too much on the nuts and bolts, and not thinking enough about the human element."

"Be more specific, Cliff."

"A lot of the crew have got the Orbitsville syndrome already. They don't see any prospect of getting back to Beachhead City, and many don't even want to get back. They see no reason for not setting up a community right here, using the *Bissendorf* as a mine for essential materials."

Garamond stopped, shielded his eyes and looked beyond the ship toward the plot of land, marked with a silver cross, where forty men and women had been buried. "I can understand their feelings, and I'm not proposing to ride herd on those who want to stay. We'll use volunteers only."

"There could be fewer than you expect."

"Surely some of them, many of them, have reasons for getting back."

"The point is that you aren't proposing to get them back, Vance. The planes won't make it all the way. So you're asking them to choose between staying here in a strong sizable community with resources of power, materials and food—or being dropped somewhere between here and Beachhead City in groups of ten or less, with very

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little to get them started as independent communities."

"Each plane will have to carry an iron cow and a small plastics plant."

"It's still a hell of a lot to ask."

"I'll also guarantee that a rescue mission will set out as soon as I get back."

"If you get back. And how can you give guaranties? You've got enemies there."

A dark thought crossed Garamond's mind. "How about you, Cliff? Are you coming with me?"

"You know it! All I'm trying to do is make you realize there's more to the thing than finding the right engineering approach."

"I realize that already. But right now I have all the human problems I can handle. The personal kind, I mean."

"Others have wives and families they want to get back to," comforted Napier.

"That's the point—I haven't."

"But . . . Aileen. And little Chris . . ."

"How long do you think they'll survive after I'm presumed dead or permanently missing? A week? A day?" Garamond forced himself to speak steadily despite the grief thundering through him. "The only reason I'm going back is that I must kill Liz Lindstrom."

ALTHOUGH it had been equipped and powered to carry out one emergency landing, the *Bissendorf* was in a supremely unnatural attitude when beached with its longitudinal axis at right angles to the pull of gravity. The interior layout was based on the assumption that, except during short spells of weightlessness, there would be acceleration or retardation enabling the crew to regard the prow as pointing "up" and to walk normally on all its levels. Now the multitudinous floors of the vessel had become vertical walls. To these were attached, in surrealistic attitudes, clusters of consoles, pedestals, desks, chairs, lockers, beds, tables and several hundred machines of various types and capabilities.

Because design allowance had been made for periods of free-fall, most small items, including paperwork, were magnetically or otherwise clamped in position. Thus little material had fallen to the lowermost side of the hull. But many of the ship's resources could not be tapped until key areas were properly oriented to the ground.

Teams of forcemasters using valency cutters and improvised derricks began slicing the *Bissendorf's* structure into manageable sections and rotating them to horizontal positions. The work was slowed by the need to sever and reconnect power channels. But within a week the cylinder of the central hull had been largely converted into a cluster of low circular or wedge-shaped buildings. Each was roofed with a

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plastic diaphragm and linked by cable to power sources on the ground or within the butchered ship. The entire complex was surrounded by an umbra of tents and extemporized plastic sheds that gave it the appearance of an army encampment.

Garamond had placed maximum priority on the design and workshop facilities that were to create his aircraft. Work advanced with a speed that would have been impossible even a century earlier. The assembly line was already visible as nine sets of landing skids surmounted by the sketchy cruciforms of the basic airframes.

The computers from the spaceship had decreed that the stressed-skin principle of aircraft construction, currently universal to aviation, should be abandoned in favor of the frame-and-fabric techniques employed in the Wright Brothers era. This permitted most technological and engineering subtlety to be concentrated in a dozen pieces of alloy per craft, and the tape-controlled radiation millers hewed these from fresh billets in less than a day. The plastic skinning could then be carried out to the standards of a good-quality furniture shop and the engines—standard magnetic pulse prime-movers—fitted straight from the shelf. It was the availability of these engines, of which there were twenty-one in the *Bissendorf's* inventory, that had been the main parameter in deciding upon a fleet of nine twin-engined ships which would set out on the journey with three powerplants in reserve.

GARAMOND, sitting alone in the prismatic twilight at the entrance to his tent, was halfway through a bottle of whiskey when he heard someone approaching. The nights never became truly dark under the striped canopy of Orbitsville's sky, and he was able to recognize the compact figure of Denise Serra while she was still some distance away. His annoyance at being disturbed faded somewhat but he sat perfectly still, making no sign of welcome. The whiskey was his guarantee of sleep and to bring about the desired effect it had to be taken in precise rhythmic doses, with no interruptions to the ritual.

Denise reached the tent, stood for a moment without speaking while she assessed his mood, then sat down in the grass at the opposite side of the entrance. Appreciating her silence, Garamond waited till his instincts prompted him to take another measure of the spirit's cool fire. He raised the bottle to his lips.

"Drinking that way can't be good for you," Denise said.

"On the contrary—it's excellent for me."

"I never got to like whiskey. Especially the stuff Burton makes."

Garamond took his slightly delayed drink. "It's all right if you

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know how to use it."

"Use it? Aren't you supposed to enjoy it?"

"It's more important to me to know how to use it."

She sighed. "I'm sorry. I know you must feel awful, being separated from . . ."

"What did you want, Denise?"

"A child, I think."

Garamond knew himself to have been rendered emotionally sterile by despair for his family. Yet he still retained enough humanity to feel obliged to cap his bottle and set it aside.

"It's a bad time," he said.

"Yes, but that's the way I feel. It must be this place. It must be the Orbitsville syndrome that Cliff keeps talking about. We're here, and a new universe is all around us, forever, and things I used to think important now seem trivial. And for the first time in my life I want a child."

Garamond stared at the girl through the veils of soft blue air. A part of his mind, despite the pounding chaos of the rest, was intensely aware of her. It was difficult to pick out a single special attribute of Denise Serra but the overall effect was overpowering. She was a lovely neat package of femininity, intelligence and warmth, and he felt ashamed of having nothing to offer her.

"It's still a bad time," he said.

"I know. We all know that, but some of the other women are drinking untreated water. It's only a matter of time till they become pregnant." Her eyes watched him steadily and he remembered how, in that previous existence, it had given him pleasure to look at her.

"Haven't you already got a partner, Denise?"

"You know I haven't."

That's it into the open, he thought. *For me to know that of all the female crew members, Denise Serra had no liaisons, I would have to have been taking a special interest in her.*

"I guess I did know." Garamond hesitated. "Denise, I feel . . ."

"Honored?"

"I think that's the word."

"Say no more, Vance. I know what it means when somebody starts off by feeling honored. I've done it myself." She stood up in one easy movement.

Garamond tried for something less abrupt, and knew he was being clumsy. "Maybe in a year, a few months . . ."

"The special unrepeatable offer will be lost to you before then," Denise said, an uncharacteristic harshness in her voice. "Have you thought about what you're going to do if we can't get a bearing on Beachhead City, if your flight never gets off the ground?"

"I'm counting on your getting that bearing."

"Don't!" She turned quickly, walked away a few paces, then came back and kneeled close to

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him. "I'm sorry, Vance."

"You haven't done anything to apologize for."

"I think I have. You see, we've pretty well solved the problem. Dennis O'Hagan didn't want to say anything to you till he'd made a check on the math."

Garamond's attention was fully captured. "How did you crack it?"

"Mike Moncaster, our particles man, came up with the idea. You know about delta particles?"

"I've heard of delta rays."

"No—that's just historic stuff. Delta particles—deltons—are a component of cosmic rays discovered only a few years ago. During his last leave Mike got himself seconded to the team investigating cosmic ray refraction by the force field that seals Beachhead City aperture. They were glad to have him because he's pretty good on the Conservation of Strangeness and . . ."

"Denise! You started to tell me how you were going to get a bearing."

"That's what I'm doing. Deltons don't interact much. That's why it took so long to find them—and that's why they can travel ten or fifteen million kilometers through air. Mike is fairly certain they can penetrate the force lens, just like other components of cosmic rays, so we're going to build a big delton detector. Two of them, in fact. One behind the other to give us coordinates. All we need then is to pick up a delton, just one, and going back the way it came will give us a straight line home."

"Do you think it will work?"

"I think so." Denise's voice was kind. "What we still have to determine is how long we're likely to wait before a particle comes this way. It could be quite a while if things aren't in our favor. But we can swing the odds by making the detectors as big as possible or by erecting a whole bank of them."

Garamond felt the distance between himself and Elizabeth Lindstrom shrink a little, and the sick joy of vengeance spurted within him. "Great news!"

"I know," Denise said. "My dowry."

"You'll have to explain that one."

"The first time you ever noticed me aboard ship was when I gave the news you wanted to hear about getting through the aperture." She laughed ruefully. "Being a pragmatist, I must have decided that if it worked once it would work again."

Garamond moved his hand uncertainly and touched her cheek. "Denise, I . . ."

"Let's not play games, Vance." She pushed away his hand and stood up. "I was childish, that's all."

Later, while waiting for sleep to relieve him of the burden of identity, Garamond was acutely aware—for the first time in months—that the hard, angry

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vacuum of space began only a short distance beneath his cot. The feeling persisted into surrealistic dreams poising him dangerously on the rim of a precipace, with a kind of moral vertigo drawing him over the edge.

XV

On his way to the airstrip Garamond was surprised to notice one of his crewmen wearing what could only be described as a coolie hat. He eyed the young man curiously, received a half-hearted salute, and decided the unusual headgear must be a personal souvenir of a tourist trip to the Orient. A minute later, while passing the workshop area, he saw two more men wearing similar hats, which he then realized were woven from fresh silver-green straw. The ancient peasant-styling, with all that it symbolized in Earth's history, was repugnant to Garamond. He hoped it would not become a full-blown fad such as occasionally swept through the crew levels. When he reached the test site, the glinting of flat green triangles in the distance told him that coolie hats were being worn by at least half the men clearing grass at the far end of the airstrip.

Cliff Napier was waiting for him at the door to the operations shed, his shoulder-heavy bulk filling the entrance. "Morning, Vance. We're nearly ready to fly."

"Good." Garamond eyed the first aircraft appraisingly then turned his gaze back along the strip. "It looks like a paddy field down there. Why are the men wearing those sunhats?"

"Would you believe," Napier said impassively, "to protect them from the sun?"

Garamond ignored the sarcasm. "But why that sort of hat?"

"I guess because they're light and easy to make. That's a good shape if the sun's directly above you and you're working in the dirt all day."

"I still don't like them."

"You're not working in the dirt all day." This time there was no mistaking the coldness in the big man's manner.

Garamond locked eyes with Napier and was shaken to feel a surge of anger and dislike. *This can't be,* he thought. Aloud he said, "Do you expect me to? Do you think I'm not making the most efficient use of human resources?"

"From your point of view, you are."

"And from their point of view?"

"The cold season's coming down soon. Most of the crew are staying here, remember. They'd rather be building houses and processing grass into protein cakes."

Garamond decided against answering immediately lest he damage a working relationship. He glanced up at the sky and saw that behind the shield of brilliance the broadest

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ribs of light-blue were well in the ascendant in the west. They signified that summer was approaching the diametrically opposite point on Orbitsville's shell, that fall was ending on the near side.

"This Orbitsville syndrome of yours," he said after a pause. "An early symptom is that a man develops an aversion to taking orders, right?"

"That seems to come into it."

"Then let's sit down together and agree on a common set of goals. That way . . ."

"That way we'd do everything you want and you wouldn't even have to give the orders," Napier said sharply, but this time he was smiling.

Garamond smiled in return. "Why do you think I suggested it?" Although the crisis had passed, he had a feeling it carried significance for the future and he was determined to take appropriate action. "We'll open a bottle tonight and get our ideas straightened out."

"I thought we were out of whiskey."

"No. There's plenty."

"You're on that stuff Burton makes?"

"Why not?"

An incongruous primness appeared briefly on Napier's dark features. "Maybe we can fix something up later. How about looking at this airplane?"

"Certainly." They walked out toward the waiting machine. It was the biscuit color of unpainted plastic. A high-wing monoplane, it sat nose-high on its skids and looking like something from a museum of aeronautics, but Garamond had no doubts about its capabilities. The ungainly ship would carry a crew of five at a maximum cruising speed of five hundred kilometers an hour for fifty days at a stretch, landing after that time to replenish food and water. Even this limitation was forced on it by the fact that more than two-thirds of the payload would be taken up by spares, an iron cow and other supplies.

Garamond glanced from the newly completed machine to the others of its kind farther back in the open-air production line, and from them up to the black rectangular screen of the delton detector on the hillside. He felt a vague spasm of alarm over the extent to which his future was dependent on complex artifacts, but this was obliterated by the yearning hunger that kept him alive, that was the motive force behind all his actions. It was ironic, he thought, that in depriving him of all worth living for in his previous life, Elizabeth Lindstrom had provided, in herself, the single goal of his new existence. She had also given him a means of escaping from it, for he could foresee no way of long surviving the act of pulling the President's ribcage apart with his bare hands and gripping the heaving redness within and . . .

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"I know what you're thinking, Vance."

"Do you?" Garamond stared into the face of the stranger who had spoken to him. He made the effort which allowed him to associate that face with Cliff Napier. There was a psychic wrench, and once again he was back in the sane world, walking toward the aircraft with his senior officer.

"Well, don't keep me in suspense, Commander," he heard himself saying.

"I think you're secretly pleased the electronics lab isn't able to build autopilots. If we're going to fly that distance, we want to fly it our own selves. We want to be able to tell people we did it with our hands."

Garamond nodded. *With our hands,* he thought. One of the group standing at the plane was wearing a coolie hat. When its owner turned to greet him, Garamond was startled to see the sweat-beaded features of Try Litman, the senior production executive. Litman was a short pudgy man who had always compensated for the natural untidiness of his physique by paying strict attention to his uniform and off-duty dress. He was one of the last Garamond would have expected to favor a badly woven grass hat. Garamond began to doubt his earlier conviction that the design of the grass headgear was symbolic rather than utilitarian.

"The ship looks good," Garamond said. "Is she ready to fly?"

"As near as she'll ever be," Litman replied.

Like the hat, the answer was not what Garamond would have expected of Litman. "How near is that?"

"Relax, Vance." Litman grinned within the column of shadow projected by the brim of his hat. "That ship will take you as far as you want to go."

"I'm ready to take her up now, sir," Braunek said opportunely, from the opposite side of the group.

"You're happy enough about it?"

"If the computer's happy, I'm happy, sir. Anyway, I did a few fast taxis yesterday and she felt fine."

"Go ahead, then." Garamond watched the young man climb into the plane's glasshouse and strap himself into his seat. A few seconds later the propellers started to turn, silently driven by the magnetic resonance engines, and the control surfaces flicked in anticipation. As the propeller revolutions built up the group moved out of the backwash and a similar scattering took place among the work gangs at the far end of the runway. The plane began to move and excited shouts went up, signifying that despite the computer predictions and tape-controlled machines, there had remained some areas of human participation.

In its unloaded condition the air-

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craft used very little of the runway before lifting cleanly into the air. It continued in a straight line for about a kilometer, rising steadily, its shadow flitting over the grass directly below, then banked into a lazy turn and circled the encampment. The soundless flight seemed effortless, like that of a gull riding on a fresh breeze, but on the third pass Garamond thought he saw a small object detach itself from the aircraft and go fluttering to the ground.

"What was that?" Napier called, screening his eyes. "I saw something fall."

"Nothing fell," Litman asserted quickly.

"I saw something, too," Garamond said. "You'd better get a medic on the truck, just in case."

"It wouldn't do any good—we had to pull the transmission out."

"What?" Garamond stared in disbelief at Litman's uneasy but defiant face. "One of the first procedures we agreed on was that the truck would be kept at readiness during flight testing."

"I guess I forgot."

Garamond flicked a hand upward, sending Litman's hat tumbling behind him. "You are not a peasant," he said harshly. "You are not a coolie. You are a Starflight executive officer and I'm going to see that you . . ."

"Braunek's coming back," someone yelled, and Garamond returned his attention to the aircraft. The pilot had not tried, or had been unable, to line up on the runway. He was coming in parallel to it, his ship rising and sinking noticeably as it breasted the wind. Garamond estimated the touchdown point and relaxed slightly as he saw it would be well to the north of the buildings and tents clustered around the hulk of the *Bissendorf*. The plane continued its descent, side-slipping a little but holding fairly well to its course.

"I told you there was nothing to worry about," Litman said in a reproachful voice.

"You'd better be right." Garamond kept his eyes on Braunek's ship. The side-slipping was more noticeable now, but each skid brought the plane a little closer to the centerline of the cleared strip and Garamond hoped that Braunek was good enough at his trade to be doing it on purpose. He knew, however, that there had to come a moment, a precise moment, in every air crash when the spectator on the ground was forced to accept that the pilot had lost his struggle against the laws of aerial physics, that a disaster had to occur. For Garamond, the moment came when he saw that the starboard propeller was ceasing to spin. The plane pulled to the right, as though the wing on that side had hit an invisible pylon, and staggered down the perilous sky toward the hillside. Toward, Garamond suddenly realized, the black rectangle of the

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delton detector. He was unable to breathe during the final few seconds of flight as the doomed ship, see-sawing its wings, became silhouetted against land instead of sky and then flailed its way through the delton screen. And it was not until the sound of the crash reached him that he was freed from his stasis and began to run.

BRAUNEK's life was saved by the fact that the lightweight frames of the detector screens served as efficient absorbers of kinetic energy. They had accepted the impact, folding almost gently around the ship, stretching and twisting, and then trailing out behind it like vines. By the time Garamond reached the crash site, Braunek had been helped out of the wreckage and was sitting on the grass. He was surrounded by technicians who had been working in the small hut linked to the screens. One of them was spraying tissue sealant over a gash on his leg.

"I'm glad you made it," Garamond said, feeling inadequate. "Are you all right?"

Braunek shook his head. "I'm all right, yes, but everything else is screwed up." He tried to raise himself from the ground.

Garamond pushed him back. "Don't move. I want the medics to have a proper look at you. What happened, anyway?"

"Starboard-wing center panel dropped off."

"It just—dropped off?" he asked incredulously.

Braunek nodded. "It took the engine control runs with it, otherwise I could have brought the ship in okay."

Garamond jumped to his feet. "Litman! Find that panel and bring it here. Fast!"

Litman, who was just arriving on the scene, looked exasperated but he turned without a word and ran back down the hillside. Garamond stayed on talking with Braunek until a medic arrived to check him over, then surveyed the ruins of the delton screen. Somewhere in the middle of the wreckage a damaged aircraft engine was still releasing gyromagnetic impulses that sent harmless flickers of detuned energy racing over the metalwork like St. Elmo's fire. Where accidental resonances occurred a feeble motive force was conjured up and the broken struts of the framework twitched like the legs of a dying insect. The destruction looked final to Garamond but he checked with O'Hagan and confirmed that the screen had been rendered useless except as a source of raw materials.

"How long till you have another one operational?"

"A week, perhaps," O'Hagan said. "We'll go for modular construction this time. That means we could have small areas operational in a couple of days, and we could build up to a useful size before your airplanes are ready to take off."

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"Do that." Garamond left his Chief Science Officer staring gloomily into the wreckage and went down the hillside to meet the group that had retrieved the lost wing section. The men set down the plastic panel in front of him and stood back without speaking. Garamond ran his gaze over it and saw at once that two longtitudinal edges that should have been ridged with welding overlays were square and clean except for small positioning welds which had broken.

Garamond turned to face Litman. "All right—who was responsible for the welding of this panel, and who was supposed to inspect?"

"It's hard to say," Litman replied.

"Hard to say?"

Litman gulped, nodded.

"Then check it out on the work cards." Garamond spoke with insulting gentleness.

"What work cards?" Suddenly tired of being pushed, Litman turned a red, resentful face up to Garamond's. "Where have you been, Mister Garamond? Did nobody tell you we've got only bits of workshop left? Did nobody tell you that winter's coming and we just can't afford all the time and material that's going into these flying toys of yours?"

"That isn't in your area of competence."

"Of course not!" The redness had spread into Litman's eyes as he glanced around the gathering crowd. "I'm only a production man. I'm just one of the slobs who has to meet your airy-fairy target dates with no bloody equipment. But there's something you seem to forget, Mister Garamond. Out here a man who knows how to use his hands is worth twenty Starflight commanders with nothing left to command." Litman clenched his fists. "What will you do if we decide not to finish your planes?"

A low, interested murmur arose from the men behind Litman.

Cliff Napier stepped into the arena. "For a so-called production man," he said, "you seem to do a lot of work with your mouth, Litman. I suggest that you . . ."

"It's all right," Garamond cut in, placing a restraining hand on Napier's arm. He raised his voice so that he could be heard by everybody in the vicinity. "I know how most of you feel about settling down here and making the best of things. And I know you want to get on with survival work before the weather turns. Furthermore, I can sympathize with your point of view about obsolescent Starflight commanders. But let me assure you of one thing. I'm leaving here with a fleet of airplanes, and the airplanes are going to be built properly, to the very highest standards of which we are capable. If I find they don't work as well as they ought to I'll simply turn them around and fly them right back to you."

Garamond paused for emphasis.

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"So the only way you'll get me out of your hair permanently is by building good airplanes. And don't come sniffling to me about target dates or shortage of equipment. Don't forget—I've seen how you can work when you want to. What sort of a target date did we have when we were getting ready to punch a hole right through the middle of Beachhead City?" Garamond stopped and outstared the man nearest him.

"A nice finishing touch," Napier whispered. "If they still have pride."

"Ah, hell," somebody growled from several rows back. "We might as well finish the job, now we've done most of the work." There was a general rumble of assent and the crowd, after a moment's hesitation, began to disperse. The response was not as wholehearted as Garamond could have wished, but he felt relieved at having maintained any kind of authority over Litman. The production executive, his face expressionless, was turning away with the others.

"Troy," Garamond said to him, "we could have talked that one out in private."

Litman shrugged. "I'm satisfied with the way things went."

"Are you? You used to be known as the best production controller in the S.E.A. fleet."

"That's all in the past, Vance. I've got bigger things on my mind now."

"Bigger than a man's life? Braunek could have been killed by that sloppy workmanship."

"I'm sorry about young Braunek's getting hurt, and I'm glad it isn't serious." Litman looked Garamond square in the eye. "The reason the men went along with you a moment ago is that you gave them Orbitsville—and that's important to them. They're going to spread out through Orbitsville, Vance. This camp won't hold together more than a year or two, and then most likely it will be left empty."

"We were talking about the plane crash."

"We don't stand united any more. Any man who trusts his life to a machine he hasn't personally checked out is a fool. You should remember that." Litman plodded off down the hillside, probably intent on retrieving his coolie hat. Garamond stared after the compact figure, filled with the uneasy dislike that a man feels for another who seems in closer touch with the realities of a situation. He thought hard about Litman's words during the midday meal. He decided to turn himself into a one-man inspection and quality assurance team, with entire responsibility for the airworthiness of his aircraft.

The self-imposed task, with its round of visual and manual checking of every aspect of the fleet production, occupied most of Garamond's working hours. It brought the discovery that he still had the

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ability to sleep without stunning his system with alcohol.

GARAMOND was spreadeagled across the tailplane of the seventh aircraft, examining the elevator hinges, when he felt a tap on his shoulder. It was late in the day and therefore hot. Temperatures on Orbitsville built up steadily throughout each daylight period before dropping abruptly at nightfall. He had been hoping to finish that particular job without interruption. He kept his head inside the resinous darkness of the inspection hatch, hoping the interloper would take the hint and go away, but there came another and more insistent tap. Garamond twisted into a sitting position and found himself looking into the creased dry face of O'Hagan. The scientist had never been a happy-looking man, but on this occasion his expression was even more bleak than usual. Garamond felt a stab of concern.

He switched off his inspection light and slid to the ground. "Has anything happened, Dennis?"

O'Hagan gave a reluctant nod. "We've recorded a delta particle."

"You've recorded a . . ." Garamond pressed the back of his hand to his forehead and fought to control his elation. "Isn't that what we've been trying to do? What's your worry?"

"We've got only about eighty percent of the original screen rebuilt."

"So?"

"It's too soon, Vance. I've been through Mike Moncaster's math a couple of times and I can't fault him. With two complete screens—which is what we planned for—to give a receiving area of five hundred square meters, we would have had to wait eighty or ninety days even to . . ."

"We were lucky," Garamond interrupted, laughing, astonished that he still remembered how. "It just shows that the laws of probability are bound to give you a break eventually. Come on, Dennis, admit it."

O'Hagan shook his head with somber conviction. "The laws of probability aren't bound to give anyone anything, my friend."

The eight aircraft took off at first light while the air was cool and thick. They climbed steadily against the seriate blue archways of the Orbitsville sky. At the agreed cruising height of five hundred meters the ungainly, stiff-winged birds leveled off, exchanging brief communications through pulses of modulated light. They assumed a V-formation and circled the base camp once, their shadows falling on the remains of the *Bissendorf*, the metallic egg that had given them birth. Without lingering further, they set course toward the prismatic mists to the east.

TO BE CONCLUDED

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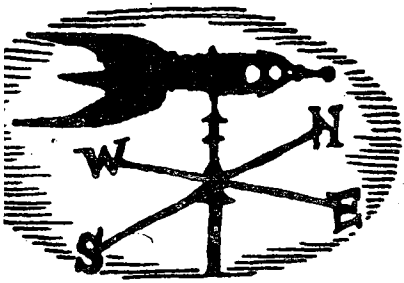

DIRECTIONS

Dear Editor:

I was pleasantly surprised when I finally opened your latest issue—the April—and saw Jerry Pournelle had done a science article for *Galaxy*. This is sf magazine science fact really moving up in the world. Of all the people I have met in my life, Jerry is one of the most colossally educated in science. He had advanced training in systems engineering, psychology, physics, mathematics, logic, and political science. He is the only science degree person I have ever known who was able to explain coherently the entire Velikovsky controversy, an hour later do the same for the Atlantean legend, and then, in a major talk, describe the new, dynamic, holographic view of the structure of the brain. Jerry has Isaac Asimov's memory in a younger body, and it comes out by instant association in a similar electrifying voice. Several sentences in his article referred to new developments in aerospace and energy science that were hitherto unknown to me—and I *try* to keep up. After reading that, the future already looks brighter to me. Scientifically oriented readers will now have to add *Galaxy* to their list of publications they need to keep up with what's going on.

Sincerely,
A. E. van Vogt

It is immensely gratifying to all concerned to receive such praise from one of your stature. Of course the obvious next step would be an A. E. van Vogt story based on an idea [or ideas] from a Pournelle column! I wonder if it could be arranged for both to appear in the same issue...
—Baen

By all rights this letter should have appeared in June Galaxy *along with the Panshins'* Forum *article which it accompanied. However, as is well known to writers, editors are sometimes blind, and it just didn't occur to me until too late. So, belatedly, a letter from Alexei Panshin.*

Dear Jim,

As the enclosed column suggests, it is time for new things in science fiction—new writers, new kinds of stories. Science fiction is about to enter a flourishing new period.

What is needed, you and I seem to be agreed, is a magazine appropriate to contain and present this new science fiction, a magazine that will communicate the fact that something new is present by its very appearance, a magazine that will

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approach the reader by displaying sf's best qualities. These best qualities are strong story values, heroes, vigor, and a sense of the meaning of our times. Science fiction at its most robust is something that a wide audience is ready to welcome.

The present science fiction magazines represent sf in a half-assed way. They are small in size. They present a negative appearance. They look like yesterday. They have small circulations (small, including even *Analog's* 100,000 plus). They are easily overlooked. My students at Cornell told me that they didn't read the magazines on the assumption that anything good in them would appear in the pb anthologies that they did buy.

This is a false assumption. Not every good thing from the magazines converts to paperback. In particular: personality, a sense of continuity, responsiveness. Compared to magazines, pbs have a cold and isolated atmosphere. Magazines are communities. Magazines give direction to their communities.

Moreover, pb anthologies are as spotty in their selections as the present magazines. Many anthologies contain nothing but original stories that have not been published in the magazines. These are generally all written around some common gimmick or assumption, and they are no better and often worse than the average product of the present magazines.

Vertex is probably a response to the same sense that there is need for an sf magazine of a new kind. But Vertex—thin, glossy, mechanical in tone, saddle-stapled—is not the right response. As a sister publication to skin books, and being like them in some essential regards, it separates itself from the conclave of digest-size sf and mystery magazines, and loses itself in rows of skin magazines. Its 8½ by 10¾ size causes it to be lost among other dissimilar magazines of that same common size. What may keep *Vertex* alive is its price—$1.50 versus .75¢ for the digest magazines. For less actual value. For better physical package and more concern with graphics.

This may demonstrate two things. Sf in a new package can sell for a higher price than the present magazines charge. And *this is a time in which even misguided experiments have a chance of success.* If *Vertex*, which in its attempt to be dignified barely identifies itself as science fiction, can succeed simply because it presents sf in a novel manner, then a new magazine in a new format with a better sense of the times and of the values of science fiction should sell strongly.

The solution is a magazine with the size and shape of the pulp magazines. In fact, it should be the pulp magazine raised to a new level. The pulp magazine gone First Class. It should be 3/4 of an inch thick, as thick as a paperback. It

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should be 7 inches wide and perhaps 9 inches tall. If placed among the digest magazines, it will dominate. If placed among taller magazines, it will elbow its way to the front.

This size speaks of an earlier day when science fiction was more forthright and vigorous, more rowdy and adventurous than it has been in recent years. The covers should reinforce this impression. They should be strongly colorful, active and positive. The cover printing should be bold.

The price for this magazine should be high: $1.50, $2.00, or possibly more.

In return, the magazine should present a generous appearance. Cover stock should be plasticized. This would permit the bold neopulp art style to become electric. It also suggests extra value. It is this generous, extravagant, bonus value that must be the spirit of the magazine. It must be generously illustrated. It must offer an ample bounty of fiction—125,000 words, perhaps. It must offer a healthy editorial side—perhaps 25,000 words of editorial, articles and reviews. The reviews should be of the books, records, movies, comic books, performers, comedians that show a sense of the new times. This new science fiction magazine should be the heartland not of science fiction merely but of the new times. It should present the emerging myth of the day. It should speak to all those who believe in ecology, evolution and synergy. All those who believe in self-transformation. In its very appearance, the magazine should speak of these things. Of new powers. Of new attitudes and new ways.

In its price and its appearance, and in its sense of itself, the new magazine separates itself from the cheap digest science fiction magazines. The title should not speak of them, either. It should be a new title altogether, free to become a new frame of mind. It should sound positive, science fictional, and of the times.

Vertexes and analogs are mechanical. *Galaxy* is physical. *If* is hypothetical. The magazine of fantasy and science fiction is initialese. Amazing and fantastic are more emotional, but the words of another time.

Quest is a possibility. No—*Quest* is not a possibility.

I've got *Dimension* and *New Realities* and *Bonzo SF* written down here. And *Overplus*, which Cory hated immediately. I like *Bonzo SF* best, but that's not it.

The title, whatever it is, should say liberation, expansion, unfolding, maturation, growth, evolution, ecology, creativity, synergy, multiplexity, multiformity, changing headstates, innerness, alternate realities.

The magazine should pay its contributors well. If original anthologies can have budgets for stories of

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$15,000 for 300,000 words and sell enough copies in hardcover and soft to justify this, then there is an audience for a quality magazine that can pay 4-6¢ a word. And pay well for good illustration and cover art.

Your suggestion of a quarterly makes good sense. A first issue could be tried as an experiment. A quarterly would be unable to run serial novels. But with the amount of wordage I am suggesting, it would be possible to run a complete novel of 60,000 words, a short novel of 25,000 words, two novelettes of 15,000 words, and two or three short stories. That would seem a substantial value to attract an audience with.

These days there is always an availability of novels. The strongest expressions of the new thing in sf and in society will be at novel length. Offer a complete novel and a number of long stories in a package of the first quality, with the spirit of the old all-story magazines, and charge well.

It takes a strong editorial vision. A refusal to compromise. But the result will have an immediate impact. It will be a center of attraction for writers and readers with a similar sense of the times.

Cory and I want a magazine of this sort. We would like to read it and we would like to contribute to it. We are willing to do whatever is necessary to see a first issue into being.

We are willing to contribute a critical article and reviews. If novels are to be the strength on which the magazine and its new vision are to be hung, we are willing to write a novel for the first issue. We are willing to scout, to knock on doors, to ask specific people for contributions, to make story assignments or whatever to get appropriate stories for a first issue.

If you are serious about putting together a science fiction magazine that is as strong as a science fiction magazine could be, you may count on us.

Yours,
Alexei

NOTICE!

Due to technical difficulties beyond our control—namely the US Post Office—Ted Sturgeon's *Bookshelf* and his new column *Interface,* did not appear this month. Ted will be back next month, and—God and the US Post Office willing—every month thereafter. Thank you for your patience.

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D. $4.75 — **Graphic Novels:** Grim Wit 1; Image of the Beast (.75); Psychotic Adventures 2; Inner City Romance 2; Dr. Atomic 2; Harold Hedd 2; Armorkins; Skull 6; Two Fisted Zombies.

E. $4.50 — **Comix by Women:** Wimmen's Comix 1, 2, 3; Pudge; Tits & Clits; Abortion Eve; Pandora's Box; Manhunt. Girl Fight.

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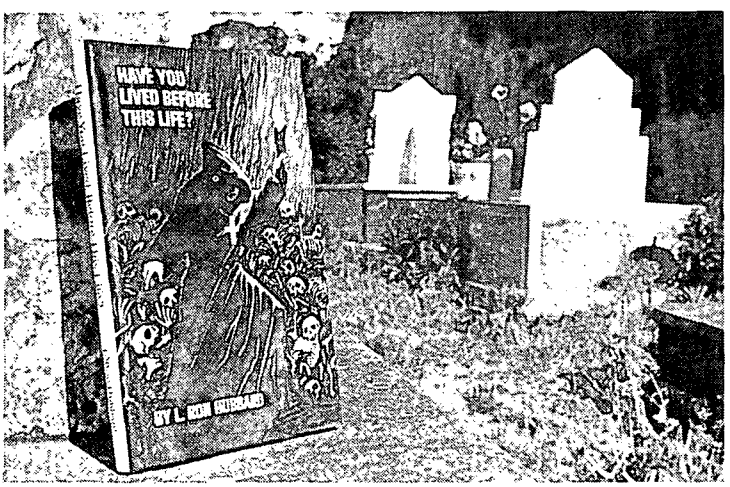

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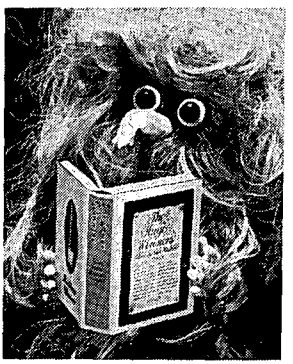

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